# The Builder.

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## "A National School of Art."

An article in our pages* under the above title has elicited some discussion which we have been glad to receive. The subject is a large and important one; none more so, we believe, to the best interests of art in England at the present time, which cannot be readily exhausted or disposed of, and which would have admitted of a far ampler exposition than we were able to give it. Though we may, perhaps, claim with our correspondents to have somewhat "intently studied the subject," we feel that no such vantage-ground has yet been reached in art-matters in England as entitles any to speak with much sense of certainty or authority; and we are, therefore, quite conscious that all which can be advanced must be regarded as tentative and suggestive, and the expression of individual opinion only.

Certain objections have been urged against the conclusions arrived at in the article referred to, which it may be serviceable briefly to notice, though in the course of that and preceding articles to which it was the sequel on the recent controversies concerning the state of English Architecture which have appeared in some sections of the press, they have been more or less anticipated.

Referring our readers to these articles for the review and examination we gave to the whole question, it will be sufficient here to state that, while our reference throughout was primarily to architecture, yet our statement and application of principles was purposely made discursive enough to embrace the issues of all art, and it is apparently in this wider sense that our correspondents have accepted it. From this point of view our meaning, perhaps, would have been clearer had we adhered to the formula, "An Art University," which would have saved any misconception arising from the use of the more restricted words "National" and "School;" though it must be borne in mind that it was to the history and development of our Modern Architecture, its present status, and the conditions by which it has become surrounded, that our argument had the largest application.

It would only be needlessly to repeat ourselves to go over the ground in regard to the history of our modern art, and the adverse influences against which it has had to contend, which induced us to express the conviction that what was now really needed was a more *definite organisation* of art for all the purposes we set forth, not as anything new, but as accordant with felt needs which were increasingly finding expression in all quarters of the art-world. In adopting the University in relation to other learning, as the type of what we believed to be required for art, we distinctly meant a Seat of Art-learning; a Central Home of Art, where its study and pursuit could be carried on and sustained in continuous growth from age to age in a manner now unknown to us.

In saying that it would be an immense gain to English Art to endeavour thus to aggregate all the existent art-faculty of the country worth cultivating; *that in the combination of original, creative capacity with combined exhaustive study of all the technique of art and the subtle problems in which its successful expression was involved lay all the possibilities of the art at our command;* that to afford a tribunal of judgment which would give a ready recognition to merit alone, and before which genius could win its true status, honour, and reward, while mediocrity would wither,—we scarcely expected to meet with much dispute or argument; but objections *have* been urged which, however, seem very much confirmatory of the positions advanced by us.

The objection of "impossibility" to such a scheme as that so barely outlined by us, from "the sectarian conditions" of English education and culture, more especially in art circles, the hostile camps, the divisions, jealousies, &c., seems a strange one, inasmuch as the hope of such a scheme would be that by raising art to a higher level freed from the causes in which these influences have their rise, they would become healed and cease; art would be followed chiefly for its *own* sake and advancement, and not under the immediate pressure of "getting a living," "securing popularity," &c., which now necessarily beget the jealousy, the isolation, rivalry, and sheer individualism, in the sense of personal distinction, which form the atmosphere in which art, whether architectural or otherwise, now too much exists. And further the objection of "impossibility" would lie against all attempts at organising any system of study on a similar basis, and could only be tested by an actual attempt at realisation. Experience in all departments of learning and science invariably proves that at a certain stage of culture the means now advocated have always been found desirable and successful.

The objection that we have abundant agencies and existing machinery for the cultivation of art, which neither cure the evils complained of, nor compass the ends in view, is a pointless one, inasmuch as these differing very largely from the remedy contemplated, *their* comparative failure proves nothing against a scheme with which the analogy is so slight.

A further objection is that we want no "forcing-system" for art. Here we think the mistake is direct. Nothing could be further from all thought of "forcing" than the calm, measured, perfected cultivation of art, and the registry of its progress and best results which would be the outcome of the endeavour we suggest, in the place of the feverish competition and restless striving after novelty which are the inevitable characteristics of our art under present unhealthy influences and conditions.

The last objection we have to note is that the art which we have is scarcely worth cultivating at all, inasmuch as we have been "grafting where we should have been growing," and that it is in consequence "hybrid," and "unsatisfactory to an advanced culture." This may be very true, but as we are only just beginning to find it out, it is difficult to say what other course could have been pursued on the sudden awakening to the fact,—scarcely a century ago,—that we had no native art at all, than a resort to the first style of art which offered itself. We have continued in a course of "revivals" and imitations, not without much success, and original treatment, proclaiming no lack of native art-faculty, but the very reverse, yet it must be confessed, without much definite progress, or the discovery of such fixed principles in art as should be the *nuclei* of further advance and more original development. But when we are told that we are and have been all going wrong, that we must "grow our art from the right seed," must have a *tabula rasa*, in fact, and begin *ab origine*, we feel that we have reached an optimist point of view, and fail to grasp what is intended, and we anxiously ask "How is all this to be brought about?"

In the mean time we have to deal with the *actual* condition of things, with the art of the England of to-day, which has reached an extraordinary and exuberant growth, and which cannot be ignored or swept away, but which certainly needs checking, pruning, and carefully cultivating upon a very different system than has hitherto prevailed. This is a practical issue which will not conflict with any endeavours to "sow the right seed and grow a true national art"; on the contrary, looking at the fact that among the Modern English art is *not* a spontaneous growth,—not a felt need of our general national life,—that it has been and must be cultivated amongst us more or less as an exotic—that the taste for art must grow by that which it feeds upon;—it seems to us that the only "possibility" for true art is its cultivation in a recognised centre of influence from which a permeative effect would go forth gradually through the land, and that the hope of sowing broadcast the seeds of art, "to grow with the growth of the national intellect," &c., is a dream of very doubtful realisation, and opposed to all we know of art-development, ancient or modern, which we still contend was the product of distinct genius in harmony with the most scientific and technical cultivation imposed by laws in optics, &c., which *must* be discovered and observed if art is to be anything but the aimless, imperfect thing, scattered as to its principles and progress, which we now see. The very elements of artistic expression are still, as to their scientific definition, groped after by us almost in vain. The laws of form and proportion by which the eye is satisfied and rests in the sense of a realised beauty, what do we definitely know of them as fixed-principles in architecture, ornamentation, &c., and, though happily now with less uncertainty, the same may be said of the harmonic relations of colour, of the perspective relationship, of the varying aspects of a building and the influences of light and shade, as the great factors in effect, whether of architecture or sculpture.

It may be also perfectly true that art was "a growth of centuries" in Ancient Greece and Mediæval Europe; but there is *no* analogy between the conditions of its cultivation and excellence in those epochs and our own. Among the Greeks it became an instinct of the national life, producing fruits which have ever been the wonder and envy of the cultured world, but by what methods we know not. In Italy exceptional conditions prevailed, and so on throughout other periods when art has culminated in surpassing efforts. We of to-day inherit some of these results, which overshadow and overawe our own weaker strivings; and whether to discard all the past—which it seems we can only distantly imitate, with no hope of rivalling—and strike out a course of our own, is just the problem with which we have hitherto been too timid to grapple.

But, after all the consideration we have been able to give to the subject, we retain the belief that living art in any nation only co-exists with that peculiar innate faculty we call genius, which finds in art its power of expression, and that in the combined operation of this as its source and directing cause alone lies the possibility of a National Art.

We might find endless practical illustrations of the advantages to be derived from making art its

* See p. 657, *ante*.

own judge, and the master of its own honours and rewards, instead of offering itself, as now, to all the fortuitous influences of public appreciation, criticism, and patronage, which cannot, for very substantial reasons, be despised, but which are yet, too often, degrading influences; and we are still of the belief that under all the circumstances now affecting the status of art in England, and more especially in regard to architecture, that the causes we have indicated in former articles as at the bottom of past misdirected efforts, undeniable failures, and abnormal results, are practically true within their range, and would find effectual removal by the scheme we have suggested of such a National School of Art, or University, as should, by the extent and thoroughness of its cultivation, its examinations, degrees, scholarships, exhibitions, competitions, and every order of honour and reward, perfect, as far as possible, such art-products as the country was capable of. An ample foundation and generous endowment, with the determination not to start with "difficulties" and "impossibilities," but to sink all these in the high aim of advancing art to an hitherto unachieved dignity of position and success, seem to be the grand requisites for an experiment which we believe the history and development of modern English art show to be its one necessity, and which would be crowned with more satisfying and important results than we can now possibly anticipate.

## A FEW WORDS TO NORWICH: APPLICABLE TO SOME OTHER PLACES.

At the workmen's meeting in Norwich, organised as usual during the congress of the Social Science Association,—a magnificent assemblage of some 2,000 persons, the sheriff presiding,—Mr. Godwin, whose name was the last on the list of appointed speakers,* said, we have heard something of various parts of the world from the different speakers who have eloquently addressed you, but I propose to confine myself to a few sentences concerning Norwich. At starting, however, I think it necessary to say, in no spirit of egotism, but because I want your confidence,—because I want you to believe that I am not dealing with a subject with which I am unacquainted,—that I have for many years made it my duty to examine seriously into the condition of our towns, and to set forth their shortcomings with the view of assisting in obtaining remedies for the sad state of things found to exist. I am not speaking for the sake of speaking, but in earnest hope that some good may come of it. An unpractised stranger entering your quaint and interesting city, and visiting its cathedral, the noble result of the piety and skill of your ancestors, which shows the handwriting of 800 years, and tells a story of great interest to those who have learnt the language in which it is written, might be excused if, noting the open spaces with which the place is dotted, and the appearance of the principal streets; and hearing of the large sums of money recently spent on sewers and other works, he came to the conclusion that little more was required to be done to protect the health of its inhabitants. If he stopped there, however, he would make a great mistake. Let him extend his walk; let him go to the courts in St. Stephen's Back-street (Pipe Burner's-yard, Unicorn-yard, and others), and he would see there ruined tenements, broken paving, full of reeking offal, rooms scarcely high enough to stand upright in, without any openings at the back for ventilation, and filled with people existing without any of the conditions necessary for healthful, vigorous, and happy life. In the last-named yard he would find one "closet" doing duty for eight houses full of people. As to pavements, one word in parenthesis. Some will recollect how Coleridge describes Cologne, that "town of monks and bones," as having—

"—— Pavements *fanged* with murderous stones."

No milder words would properly describe the pavement in the worst parts of Norwich, and it should be remembered that this is more than a question of comfort. It is not merely that such pavements wear out shoes and tempers, but they retain filth dangerous in decomposition, and productive of most evil consequences. Then let the visitor go to the other side of the city,—to Cowgate-street and Pockthorpe,—let him go into Cook's-yard, Queen's-yard, Ship-yard, or Dial-yard,—I had almost said "*Die all yard.*" The state of things there is abominable and terrible. These courts are full of filthy smells. In one of the yards, which it is unnecessary to specify, because I am unwilling to annoy owners or the corporation more than is necessary, the pump which supplies eight or ten families stands close to a wretched cesspool, called an "accommodation" for fourteen families,—a cesspool with a stick across the top of it. In another of the yards a woman told me that no one could drink of the water of the pump without being ill, and therefore no one did drink of it, and they were obliged to beg, borrow, or steal water as they could. I was not surprised to hear that, or to hear that when small-pox visited the city these yards were decimated. So they would be again should an epidemic at any time break out. In another court there is an open midden within 5 ft. of the door of a room occupied by a woman and four children. This woman said, "The children are sick, sir, every day." Little wonder; for I myself felt sick and depressed for the remainder of the morning, and went away with a sore throat. Fortunately, people are nowadays punished for adulterating food; they ought also to be punished for compelling their fellow-creatures to live in adulterated air, or to drink adulterated water. What we want are clean air, clean food, and clean water, which at present the inhabitants of none of these courts or yards can get. I repeat, it is not my desire to annoy the authorities, but they must not be allowed to suppose that health and life are not being sacrificed in this city. Life and health are worth money: they are worth all the money. Put life and money into opposite scales, and money must kick the beam. It is only because we trust to the chance that both may be retained that we hesitate to spend one to secure the other. The corporation has done a great deal, and I trust they will be in no way deterred by the failure of the sewerage works, which is simply a failure in construction, and a matter of money. It is to be hoped they will not give up the plan they have adopted, because I thoroughly believe the best plan for the disposal of sewage is by irrigation. It will all come right in the end. Several other important points for comment press upon me, but the limit of time prevents me from going on. The infant mortality of the district, for example, is terribly great. I have not returns from Norwich itself, but a Blue book issued by the Lords of the Privy Council, and which, like most Blue books, remains unopened, shows that in seven districts round the Wash, taking in part of Norfolk, about 23 infants in every 100 die, Norfolk being the highest in the list. I should like to say a word or two, also, as to the cultivation of the Beautiful, in respect of health, the value of scientific and artistic knowledge: not merely a money value, although that is considerable, but as opening the mind, affording means of delight, and contributing to make existence happy. Innocent recreation is no small thing. The cry of the Roman people was Bread and the Circus, and this has been the cry of human nature ever since, and everywhere wise statesmen will aid in providing recreation of an innocent and elevating character.

There is a higher life than the mere bread-and-cheese life: let us all strive for it with *Excelsior* for a war-cry. Only one word more. Do not expect to have things done for you: try to do them for yourselves: and when you are called upon to elect municipal officers, do not vote for those who merely promise to save your money by opposing all improvements and ameliorations: rather help those who have shown by their previous acts that they will strive, under Providence, to protect your health, advance your happiness, and save your lives.

* Lord Houghton, Lord Napier, Mr. Dudley Field (New York), Mr. G. W. Hastings, Mr. T. Brassey, M.P.; Mr. D. C. Heron, M.P.; Professor Hodgson; and Mr. Godwin.

### Permanent Art Gallery for Warrington.

A local paper states that "a permanent art gallery for Warrington is a matter of something more than speculation. It has been some time known that Colonel Wilson-Patten, with his accustomed liberality, has offered land for an extension of the Museum buildings, which extension would afford room for the growing wants of that Institution, and an opportunity for the display of pictures already given, or hereafter to be given for the purpose. With the rapid growth of the town it is evident that the present Museum buildings will soon be inadequate to the wants of the Museum itself, and certainly inadequate for those extensions of its scope and purposes the times are calling for."

## SANITARY AND EDUCATIONAL EXHIBITION AT NORWICH.

The new feature of the Social Science Congress, an exhibition of sanitary and educational appliances, first adopted at Leeds, two years ago, is considerably developed at Norwich, and bids fair to become of importance. The collection, in the Drill Hall, at Norwich, comprises 120 exhibits, including ventilation arrangements, improved stoves and ranges, filters, school fittings, drainage appliances, models of schools, and prisons, and other cognate matters. It was opened by the Sheriff, Dr. Bateman, with an excellent address, as a free exhibition, but the attendance soon became so large that it was found necessary to make a small charge during certain hours of the day, in order to lessen the pressure for those who really desired to examine the articles carefully, and with a purpose. A certain number of adjudicators have been appointed by the council, whose duty is to report on the various objects exhibited and advise as to the bestowal of certificates of approval in certain cases. Of the wisdom of this we are not quite certain.

Prominent in the Exhibition are Messrs. Doulton & Co., who have a goodly show of drain-pipes, traps, sinks, closets, and such like, for sanitary purposes, both in stoneware and earthenware. Their system of irrigation is worthy the attention of those interested in such things. They provide a main carrier of either the ordinary drain-pipe or as an open channel, the capacity of the latter being increased at pleasure by the addition of copings of the same material on each side. These communicate with the distributors by means of a sluice-valve, which may be regulated at pleasure. The Sgraffitto jugs first introduced about three years ago deserve especial praise for their variety and beauty both of shape and decoration. The painted tiles show considerable merit, and a great improvement is effected by the use of a particular body of clay, which avoids the harsh and crude appearance often given to works of this kind, however meritorious, when executed on purely white glazed tiles. This is especially noticeable in a design for mural decoration exhibited. Nor will we omit to draw attention to some bosses or discs in salt-glazed stoneware, the colours of which are very effective. The introduction of such a material and in such a form, which is absolutely impervious to the action of any atmosphere, or even to acids, and which admits of varied treatment, cannot but prove an acquisition to architects desirous of using colour in external decoration.

Messrs. J. L. Bacon & Co. stand well amongst those who send heating arrangements. They show a method, by hot-water apparatus at work, of warming schools, churches, and houses. In their system small pipes are used so as to require but little room, behind skirtings for example, and means are adopted to obviate the objections that have been made to the use of the close boiler. The cost of the plant and arrangements for heating an average house is put at 120*l.*, and the annual expenditure at about 5*l.* 10*s.* for the winter.

Messrs. Rosser & Russell are large exhibitors of warming apparatus and improved ranges and stoves, including a *reversible* fire-grate, by means of which the fresh coal is placed at the bottom of the incandescent mass, so that the smoke is consumed. Their diagrams include illustrations of the mode they adopted in warming and ventilating Guy's Hospital.

Mr. Pritchett, architect, sends three lengths of Doulton's 21-inch tubular drain-pipes, put together with *compressed* cement so strongly as to admit of their being connected before they are lowered into the trenches, and to withstand pressure so as to substitute them for iron pipes and save money.

Various other applications of the use of stoneware are shown: Blackmore's glazed earthenware cisterns; Kemp's improved chimney-pot, for preventing down-draught (worth trying); and others.

The indefatigable George Jennings is, of course, represented, sending his valve closet and trap in one piece of earthenware, fitted with automatic disinfector for the purification of the air, to disinfect all fœcal matters on the instant, the neutralisation of all sewer gases, and the disinfection of house-drains and sewers by the liberation of the waters used. We were glad to be able to notice the right appreciation shown at Vienna of what Mr. Jennings has done, and is doing.

Amongst the various traps exhibited we notice

the "Redcliffe Sanitary and Ventilating Trap," patented by Mr. McNeil Greig, the inventor, which is of stoneware, glazed inside and out, well arranged to check the entry of sewer gas to the building, and not expensive. There are many other interesting and useful matters, to which we would refer, but space fails us. Let us hope that the various inventions which are really good will be not merely looked at, but made use of.

## ON SOME CRITICAL VIEWS OF ST. PAUL'S CATHEDRAL.

A few weeks since we noticed at some length the historic information in regard to the present St. Paul's Cathedral and its Gothic predecessors, conveyed in a compact and readable form in Mr. Longman's work recently published. The author of the "Three Cathedrals dedicated to St. Paul in London," supplemented the historical details given in his book by some comments on the architectural merits of the building, as well as by the reprint, wholly or in part, of several critical judgments on Wren's design, from various quarters. These, while they illustrate the diversity of opinions and tastes which have been exercised upon the architectural design of St. Paul's Cathedral, serve also to indicate how strong an interest the building has possessed for the different classes of critics, who have taken so much trouble in attacking or defending the weak points of the design.

Popular opinion, for the most part so favourable, even to the extent of enthusiasm, to St. Paul's, has had its fluctuations on this head, nevertheless. The earlier days of the Mediæval revival, for instance, brought obloquy to the hitherto venerated dome, which was branded as "Pagan;" and there were not wanting sterner (or more crazed) fanatics who openly averred that they would rejoice to see it burnt. These were, however, exceptional extravagances; and at the present moment we find even some of the most uncompromising adherents of Gothic architecture speak with respect and admiration of Wren's work, as regards its general design, at all events; the vials of their wrath being reserved for the details. That Wren was a gifted architect, working in a bad and artificial style; that the general grouping and outline are very noble, but some of the details commonplace, and that these faults were those of his day rather than of the architect himself;—this is, just now, about the sum of the professional verdict even of those who are most opposed to the Renaissance style; and this qualified judgment has largely permeated the non-professional mind. Previously, however, to the rude disturbance of their faith by Mediævalisers, the British public regarded St. Paul's as the central and culminating point of our native architecture, the perfection of which no right-minded or properly educated man would think of questioning. Mr. Longman, in his own comments on the cathedral, exhibits a revival of this old-fashioned worship, in all its fervour and simplicity. He thus commences his descriptive chapter of the cathedral:—"The knowledge of the most accomplished architect, combined with the descriptive powers of the most eloquent writer, would be required to do justice to the grandeur and magnificence of St. Paul's. I cannot pretend to even any approach to the first, and without it, had I the graphic pen of a Macaulay, it would be hardly practicable to paint in words a building the vast extent and noble proportions of which stand in the way of its appreciation by uninstructed minds" (p. 163). The author goes on to say that he has availed himself of the writings of "accomplished scholars" in his description, while he appends in a separate chapter all that has been said in the way of fault-finding by architectural critics of any standing.

The first page of the description touches on a point of difference between critics, viz., as to the introduction of the north and south chapels and their effect on the exterior design. Mr. Longman quotes from Mr. Wightwick's paper on "the genius and architecture of Sir Christopher Wren" (read at the Institute of Architects, May 30, 1859) some remarks entirely in condemnation of these "excrescences," as they are there termed, especially in regard to the longitudinal faces of the design. Without entering into the question how far their existence is entirely owing, as is stated, to the interference of the then Duke of York and his desire for a building prepared for the re-establishment of the Catholic ritual, it may be questioned whether, on the whole, this additional mass of building in connexion with the west end of the structure is not an advantage when seen in perspective, though when drawn in flank elevation, it bears out Mr. Wightwick's remarks, in so far as "destroying the vertical emphasis of the towers." A Gothic architect could have dealt very well with such an addition, and have made it a manifest improvement. The difficulty in Wren's case was that his principle of design compelled him to carry up these subordinate chapels to the full height of the main structure and carry all the architectural "scenery" of the upper portion round them, so that they became unduly magnified in importance. But it may be a question whether the towers, if left free to the ground on three sides, would not have been rather wanting in mass, for their height; and "vertical emphasis," after all, is not what we most look for in a Classical design. Internally, the gain in architectural effect from the chapels will scarcely be questioned by any one.

The dome, according to Mr. Longman, "is by far the most magnificent and elegant feature in the building, and rises from the body of the church in great majesty." Without questioning the sentiment conveyed (though the manner of it be rather like a sentence from a young lady's school essay), it may be observed that one becomes more impressed with the merits of the existing dome on comparing it with the design which Wren originally made as the final one for this central feature, and which is reproduced at p. 113, with the facsimile of the signature of Charles II., authorising it as "very artificial" (*i.e.*, artistic), "proper, and useful," which at all events is more than could be said for his most sacred majesty himself. Nothing could be more significant of the utter carelessness of the king as to the architectural development of the building than the fact that Wren carried out the dome as it stands, apparently without opposition, though he had pledged himself to a design utterly different, and from which he had been formally forbidden to deviate, except in matters of detail. Architecturally considered, it is somewhat difficult to credit the two designs to the same person, so exceedingly inferior is the signed one to that executed. Wren seems to have been haunted with the idea that something in the shape of a spire would be expected, and must be provided, to replace the spire of the old cathedral. Accordingly, he shows a segment of a rather flat dome rising from the crossing, upon which is placed a lofty cupola, with its own domical covering (of rather elevated pitch), nearly three-fourths the width of the crossing; which, though it certainly could have been safely constructed by treating the intrados of the lower dome as a cone, or something near it, looks painfully insecure externally, standing upon the flat curve of the lower dome. The upper dome terminates in a tall spire arranged in stages, diminishing telescope fashion, and with a railing round at each stage; on the whole, looking a good deal like a Chinese pagoda. This drawing lends some colour, it must be admitted, to doubts which have sometimes been raised as to how far the design of the existing dome really is Wren's original idea, or what proof we have that it is; the last authentic drawing being so greatly inferior. Perhaps the resemblance in type between the "Kensington model" dome and the present one may be a sufficient set off against this; at all events, it is little short of a national boon that the design approved by the Royal signature was so signally deviated from. In one respect the dome of the "Kensington model" is superior to the present one, in that the buttresses at the base of the dome are openly shown and treated as buttresses, instead of being masked, and form, with their curved outline, a very happy instance of an essentially Gothic feature being adapted to a Classic design. As an instance of the correct architectural expression of construction, this is superior to anything in the existing cathedral. And as to the plan of the Kensington model, it must be regarded, on the other hand, as a national loss that this plan was *not* carried out. Its capabilities in regard to internal effect would have been splendid, and it would have afforded a unique instance of a congregational cathedral with a congregational plan.*

* A "Protestant" plan, it has been sometimes called; but the epithet we use is more to the purpose, and sufficiently opposed to the other ideal of a *spectacular* ritual; and to speak of one method of architectural design as more "Protestant" than another, involves some absurdity, or, at least, incongruity, besides opening the door to the *odium theologicum*.

In external effect we cannot regard the Kensington model, considered as a whole, as equal to the present cathedral; but the defect lies chiefly in the weak and somewhat pointless treatment and composition of the *pro-naos* portion. The main part of the edifice would have been susceptible of a grander effect than the present cathedral presents, with some modifications in detail; the use of the four great horizontal curves on plan, forming abutments to the dome, is a grand instance of the combination of structural and architectural design. But it would have required a broader and bolder treatment in regard to the lesser architectural features, and we may concur partially in Mr. Fergusson's judgment (quoted at p. 112 of Mr. Longman's book) that this design is materially injured by the "clumsy attic, and by the arbitrary and purposeless variety in the size, position, and number of the windows and openings." If an opportunity should ever occur, however, it would be worth while to have this plan worked out by an architect of ability and good taste, who could make the most of the idea left to us by Wren.

The battles of the critics have been fought over two other points in connexion with the dome—the plan below and the roofing above. The springing of the drum from an octagon instead of a square has been variously represented as a merit and as a defect; the principal adverse critic urging that in such a treatment the arches on the cardinal faces must necessarily appear too small in proportion to the height and area included in the dome, especially when viewed from the further side, across the intermediate central space. We have not felt this in the case of St. Paul's, and incline rather to the opinion that in building on a large scale the immense void left on each face by the four great arches when the square plan is adopted, is rather an architectural disadvantage, destroying scale, and giving a sense of insecurity. Wren's octagon plan affords evident and ample basis for the dome, besides getting rid of the immense overhanging mass of the pendentive, which has been a structural and architectural bugbear in the buildings of all nations by whom the dome has been largely employed. The octagon arrangement of the piers, too, when well treated, gives scope for more variety of perspective effect than the four angle piers afford. That the intermediate faces of the octagon were not happily treated by Wren is a point on which there is at the present day no difference of opinion; and, though suggestions have been made, we doubt whether it would be possible now to improve the effect without structural alterations at the angles of the crossing, which it would not be advisable to attempt. The covering of the dome has elicited even more admiration and criticism than the planning; admiration, of the most unanimous description, in regard to the constructive treatment, and criticisms and replies in regard to the alleged architectural falsity involved in the two roofs. The quotation from the "Parentalia," cited by Mr. Longman on page 196, shows how Wren was supposed by his grandson to have regarded this, and that he considered the leaden dome in the same light as the leaden roof over the lower vaulting; an outer covering for preservation; which is the argument used by its modern defenders. The "Parentalia" hints also, however, at the influence of the popular feeling in favour of something lofty, to remind them of the old spire; the same feeling which prompted the spire in the signed design before alluded to. If this be the case, Mr. Longman is right in the view he seems to take (p. 199) in regarding the inner dome as the primary object in the mind of the architect, and the other as a finish put upon it for external effect. That the outer dome is very beautiful in regard to composition of lines is unquestionable; but whatever arguments may be used in defence of the treatment adopted, whenever we begin to look at the external dome as a mere covering, and remember that it is not the real dome, it is impossible (begging pardon of Mr. Longman and his authorities) not to feel a certain dissatisfaction natural in contemplating a thing which is not quite what it professes to be, and is not in keeping with the monumental character of the lower part of the structure. The arrangement may be ingenious and elegant, but we feel that it is not the best possible,—it is an expedient only.

The conflicting opinions on other parts of the structure, included in Mr. Longman's chapter (xiii.) of criticisms, form a somewhat edifying *mélange*. Strype thought that any one surveying St. Paul's from the neighbouring hills would

immediately discern that the design was defective, in having no eastern turrets to match the west ones, and in not having the dome planted exactly in the centre. His remark about the want of projection of the columns of the portico is somewhat more to the purpose. In the main, however, the "doctors differ" less about the west front than about any other part. It has received general admiration; though Mr. Fergusson's carefully-worded approval is apparently by no means exuberant enough to satisfy the optimist critic of Paternoster-row. The fact that the front stands obliquely to Ludgate-hill (though it was Wren's wish to have had it directly fronting the street) is in some respects an advantage. We get a far more picturesque grouping of the dome and the west turrets than if the building had faced the approach centrally and symmetrically. The two orders, one over the other, on the exterior, form a fine field for the critics. One objects that the building shows externally no suggestion of two stories, or two aisles of different heights; another complains that two stories are suggested which do not exist. Wren's original intention had been to use one large order and an attic, as seen in the Kensington model. This would have been more logically defensible, no doubt; but, as a matter of fact, it would have diminished the apparent scale, and given a less picturesque appearance to the whole. The one-order scheme was abandoned, from the difficulty of finding stone large enough for the great pilasters. Perhaps the most whimsical objection which critical pedantry has directed against the building is that which sees an unpardonable sin in the coupled columns in the west front, a point on which the purists agree with almost the proverbial unanimity of critics. It might have been supposed that any one with the slightest eye for architectural effect must see how vastly superior is the result of these doubled columns in such a situation, to the comparatively lean and meagre appearance which single columns would have presented; yet all this attack is made on it, merely because the Romans did not employ columns in this way.

In regard to another fault laid against Wren, however, judgment must go forth. We do not see (again begging pardon of Mr. Longman and his witnesses) that anything can possibly justify or excuse, on grounds of architectural art or of common sense, the fact that nearly the whole of the upper external story of the cathedral is one gigantic sham,—a screen-wall to hide the real construction. Of the non-professional spectators of St. Paul's, probably not one in fifty reflects what is the connexion between the external and internal design. But if the said spectators were once made to understand that nearly half of what they see of the height of the exterior is merely so much walling, standing up by itself, quite independent of the real building, a kind of empty box of masonry, probably there is not one in fifty who would not exclaim, "How absurd!" The expense of this "scenery," as it may be termed, must have been very great, and it remains a standing monument and warning of the absurdities into which a gifted architect may be betrayed when he follows fashion instead of truth in the form of his structures. We recommend amateur readers, while drinking in our author's eloquent exposition of this "sublime structure," not to omit attention to the small diagram given from Gwilt (on page 186), showing the section of the cathedral, and if they do not understand its significance, to get an architect to explain it to them. It may give them a new idea of the distinction between real and sham architecture.

Of the interior many of the details are, judged by modern lights, open to much criticism; and the impression of the whole rather than of parts must be looked to for satisfaction. The springing of the transverse arches of the vaulting from an attic is a total contradiction of the motive and origin of the attic; and the carrying of the crown of the nave-arches above the line of the architrave which is superimposed on the main pilasters, has a very weak and clumsy effect. There are difficulties, it may be said, forced upon the architect by his working in the trammels of an artificial style; still, if that artificial architecture is carried out at all, it should be done in accordance with logical rules and principles, or confusion worse confounded is the result. Mr. Fergusson's strictures (quoted, page 93) against the domical vaulting, are somewhat overdrawn, except as regards the heavy and commonplace wreath ornament which surrounds the main compartments, which is a matter of detail; the domical arrangement of the ceiling generally is effective and suitable enough, and we cannot see ground for so condemnatory a verdict upon it.

The history of "the adornment of St. Paul's," or rather of the ideas and notions which have been afloat as to its adornment, forms, of course, a chapter in Mr. Longman's book, and he is to be congratulated on having perceived that the word "adornment" is the right one to use here, and not "completion," of which we heard at first,—an expression which at once assumed the very point at issue. The most noteworthy item in the history of the schemes for adornment is the proposal of Sir Joshua Reynolds, greeted warmly by the then dean and chapter, that certain of the Royal Academicians should undertake the painting of pictures in the cathedral; but in what medium, whether fresco or oil, there is nothing to show. If mural paintings were intended, we may well share the "shudder" of Dean Milman at the idea of the walls being adorned with the works of Cipriani, West, Dance, and Angelica Kaufmann, who, with Reynolds and Barry, were the artists selected. Even Barry, with a certain power, showed an inherent vulgarity of manner in his work. "Newton on the Prophecies" was the dean under whom this attack on the edifice was threatened; but the Archbishop of Canterbury and the Bishop of London, trustees of the cathedral, put a stop to it from motives as wise as those with which it was to have been carried out. The history of the recent movement in favour of a grand scheme of decoration need not be recapitulated; but we may call attention to the moderate and sensible ideas on the subject put forth by Dean Milman, who wished for "such decorations as might give some splendour while they would not disturb the solemnity or the harmonious simplicity of the edifice." More recent talk on the subject has gone far beyond this, and has threatened an almost theatrical splendour which would inevitably detract from the effect of the whole. We are glad to observe that Mr. Longman, as a member of the committee, is opposed to any further employment of Munich stained glass, to which we were willing originally to give a chance. The suggestion of a light and delicate diaper treatment for the windows has already been made in our own columns, and elsewhere, and in the event of figure subjects in mosaic forming part of the decoration, is the only way of treating the windows, chromatically, which will not injure the effect of the other decorations. In the short concluding chapter on "The future of St. Paul's," are some further remarks in regard to the contemplated decoration, which may be wise or not according to the meaning attached to them, for they are somewhat vague. The general argument is in favour of coloured decoration by means of material; but if this is to mean a complete system of structural polychromy, we can only say that this would lead to a degree of expense and of cutting to pieces of the interior, quite unwarrantable, and for which the public will certainly not subscribe money if they once clearly understand what such a scheme means. Structural polychromy in a large building must be carried out from the first, and can only be achieved afterwards at an expense quite disproportionate to the result, and after a series of operations which practically amount to making a new building of the interior. Gilding and mosaic may be so treated as to furnish all that is desirable, combined perhaps with a new marble pavement. After making his protest in favour of coloured material, Mr. Longman adds,—

> "The terrifying spectre of 'sprawling saints' and emblematic figures thus entirely vanishes; for it is obvious that, as a general rule, it is only in mosaics that figures can be introduced. It is true that the designs for mosaics, whether in the dome, cupolas, or spandrels, will require artistic skill of the highest excellence for their production, but it is equally clear that they will not easily give room for extravagances representing peculiar ideas as to worship or doctrine."

If Mr. Longman penned this sentence in good faith, we can only say that he knows less than we do of the nature of the propositions that have been put forth, or fails to appreciate their significance. We have no dread of "sprawling saints," certainly, for we never knew any modern Mediæval saints do anything so life-like as "sprawling" would indicate; but it is a fact that a scheme was laid before the committee, including the execution in imperishable mosaic of a whole hierarchy of saints, of many of whom the very names are scarcely known, all with their proper symbols (raked up by a search among monkish archives), and "with their names written under them." To ask for national aid to such a scheme of decoration would be absurd, as it represents only the fancies of a small school of decorators and amateurs, which the majority of educated men and women would still, we hope, regard as childish and utterly unsuitable. The portrayal of saints in the Middle-age windows, and other decorative designs, has its interest, because it was the offspring of a genuine feeling; but there is nothing in the modern arts connected with architecture more offensive and contemptible than the species of "saint-manufacture" which has been developed as a part of modern ecclesiastical decoration, and the kind of *dilettante* ritualism which revives things, once held sacred, but now regarded merely as so much decorator's furniture. Our great Renaissance cathedral, the architectural type of an intellectual revival, must at any rate be preserved from this taint of intruded sham Mediævalism, not only as regards mere style of treatment, but as to the nature of the subjects selected to form part of the decoration. If it is to be a national work, let the pictorial portions of the decoration of St. Paul's deal with subjects that appeal to the higher feelings of humanity at large, instead of forming a mere development of the shibboleth of a clique in ecclesiasticism and so-called ecclesiological art. Otherwise, the work proposed, whatever the money expended, will neither be a credit to this, nor a satisfaction to future, generations.

## ON DEFECTS IN THE METROPOLITAN BUILDING ACT.

In the Health Department (Social Science Association), Mr. H. H. Collins, architect, read a paper relating to the question, entitled "A few suggestions relative to some of the defects in the Metropolitan Building Act (18 & 19 Vict., cap. 122) as applied to dwelling-houses." He said (adopting our statements and calculations) that in the ten years, from 1861 to 1871, more than 220,000,000*l.* had been expended in the erection of nearly a million dwellings. Assuming that the population would increase in the same proportion in the current ten years, it had been calculated that nearly 1,500,000 houses would have to be erected at a cost of 261,692,000*l.*, requiring an expenditure of 26,000,000*l.* per annum. A large portion of this stupendous expenditure would undoubtedly fall to the lot of the metropolis, and how prolific of good or fruitful of evil it might become! In considering the restrictive conditions under which this work should be permitted to be executed in the metropolis, he directed attention to some omissions in and the defective provisions of the Metropolitan Building Act, occasionally referring to the 8th & 9th Vict., cap. 84, which he said certainly possessed a far higher appreciation of sanitary requirements than the one by which it was repealed. Sanitary legislation, from its commencement to the present time, had been but a series of spasmodic measures; consequently its administration was difficult, its clauses were confused and ambiguous, and its objects often ill-defined. Its authorities were disjointed, and acting without co-operation or harmony, the decisions of judges or magistrates conflicting or antithetical, and its legal proceedings cumbersome and expensive. A digest only of the statutes relating to public health occupied 260 octavo pages. There were also about twenty fundamental Acts. The remedy for this confused state of things lay in the codification and consolidation of the laws as relating to public health. Mr. Collins divided sanitary legislation into two heads, which he named extra mural and intra mural. By the former, he meant all the enactments applying exteriorly to dwelling-houses, and under the jurisdiction of the local highway authorities. By the latter, he meant all enactments applying to a dwelling-house *per se*, the line of demarcation being drawn at the limits or confines of the public highway. Confining his attention to intramural conditions, which should be clearly provided for in a Metropolitan Building Act, he dealt with those inconsistencies which were designated exemptions, and which permitted of immunities prejudicial to public welfare. After showing the necessity for special supervision for exempted places, Mr. Collins said intramural legislation must divide itself into the following considerations,—stability of construction, hygienic construction, and aphlogistic construction,—all happily dependent on and incorporated with each other. As regarded stability of construction, a clear and

unambiguous definition should be insisted on for the word foundation. All damp, loose, or made ground should be removed, and the excavation continued until a firm, solid bottom on the virgin ground could be obtained. On this a layer of concrete of certain specified thicknesses should be insisted on where essential land-drains should be required to be laid in. As to walling, the present Act demanded footings for their support, and few members of the profession but disregarded this regulation, and put them in as they thought necessary. It should be enacted that all walls and footings should be erected of certain specified dimensions, varying according to the purposes for which the building was intended. They should be composed of good bricks, or stone or other material, which should be new, and combined with a proper defined mortar or cement. The use of old material was to be deprecated. Between footing of walls thus built there should be imbedded an impervious damp-course; and no floors, whether of wood or stone, should be permitted to be laid which did not allow of at least 12 in. between themselves and the highest part of such footing. The walls should, as far as fire was concerned, be homogeneous in their nature—if of stone, built of stone; and if of brick, of brick. The walls should be covered at their termination with a material impervious to wet. There was a defect in the present Act as regarded thickness of certain walls of buildings of the dwelling-house class, which allowed of the upper story being erected of brickwork of 9 in. thick. In this variable climate it was impossible to keep out humidity and cold with such a thickness, more particularly with the absorbent nature of the materials at command; and the upper stories, mostly inhabited by children, were especially most subject to driving rains. Walls should not be of a less thickness than 14 in. Under the second head of sanitary construction, the internal sewerage of a house was the first consideration. The closet apparatus, sinks, and water supply should be under supervision; and each house, according to its purposes and number of inmates, should be provided with a certain number of conveniences, and with a certain cisternage, all to be defined. It should be compulsory to carry all soil pipes up to roofs, discharging away from windows and chimney stacks; not to permit rain water pipes to become waste-pipes, and that each waste-pipe from sinks should turn out into open areas with open ends, so as to admit of being easily cleaned out. No works should be permitted to proceed unless a perfect system of drainage was arranged. Mr. Collins also suggested improvements in ventilation, such as a garden area at the backs of houses, fireplaces in each room, and the prevention of over-crowding. Light and ventilation could not be too well considered and provided for. The subject of ingress to and egress from buildings also required attention, with a view to affording escape in the event of fire. Stone was not a fire-proof material. There should be more outlets from public buildings. It should be made compulsory to construct such exits in accordance with well-defined principles, and of certain areas made proportionate to the dimensions and exigencies of the special class of buildings to which they might be attached. All corridors, stairs, and approaches should have fire-mains continually on. Every individual was supposed to know the laws of his country, and none should be permitted to plead ignorance thereof.

## A NEW CLUB HOUSE IN LIVERPOOL.

A large mansion in Mount Pleasant, Liverpool, belonging to Mr. William Rathbone, M.P., which that gentleman has placed at the disposal of a committee for the purposes of a club for clerks and others, has just been undergoing extensive internal alterations, in order to adapt it to its intended purpose; and in addition to these alterations, a large billiard-room to hold six billiard-tables has been erected. This room is altogether lighted from windows above. The alterations in the interior of the building include the re-construction of the whole of the apartments. A large room to the left, on entering the building, which has been connected with the newly erected billiard-room, will be used as a smoking-room. A room on the same floor, and overlooking a fine garden to the rear of the house, has been fitted up as the dining and luncheon room. On the first floor a large room, also overlooking the garden, has been fitted up as a reading-room, whilst an adjoining room on the same floor will be devoted to chess, draughts, and other games. The committee have decided that beer and spirits shall be provided for the members in order to prevent them frequenting the ordinary public-house, and for this purpose a bar at the left of the building has been fitted up with beer-engines, and other necessary apparatus for carrying on the work of the bar. Commodious kitchens with modern ranges, have also been fitted up at the rear of the bar. The walls of all the rooms in the building have been handsomely decorated, and painted in pea green, whilst the hall, lobbies, and staircases have been painted a stone colour. A large garden to the rear of the house is to be converted into a bowling-green, for the use of the members. There are already upwards of 400 members enrolled, and the inauguration of the club is to take place during the present month, with considerable ceremony.

## ARRANGEMENT AND CONSTRUCTION OF LABOURERS' COTTAGES.

In the Economic Department (Social Science), Sir W. Jones read a paper "On the best Plan of Constructing and Arranging an Agricultural Labourer's Cottage." He said, labourers' cottages in the rural districts ought to face the south, and they should be built in pairs. The walls ought to be 14 in. thick, and have two windows, large to the south, and small on the north side. The large windows, to let in the sun, need be no additional expense, as wood and glass are as cheap as wall. The small windows on the north side keep out the cold. The walls ought to go up to the ceiling of the upper-floor rooms; and no lucarne-windows, or any break in the roof, involving gutters, and thereby expense of construction and repairs, ought to be allowed. The chimney-shafts should all be in the partition-wall, so that any fire burning will tend to warm both houses. The cottages should have each three bedrooms, one sitting-room, and one kitchen and wash-house. If the third bedroom is got by subdividing the space over one of the ground-floor rooms, the two bedrooms so obtained are always too small for health and comfort, the smaller of the two being generally not more than 6 ft. in its narrowest measurement. In looking over sixty plans sent in for Mr. Pratt's prize, at the last show of the Norfolk Agricultural Society, three-quarters of those sent in had this defective arrangement, and were at once disqualified in consequence. The third bedroom must therefore be external to the shell of the house, and the question is where it can best be put. Two plans suggest themselves,—first, to build an external shed or wash-house, and carry it up to the first-floor, with a bedroom over; or, secondly, to put the bedroom on the ground-floor. The plan selected for the prize had the bedroom on the ground-floor. At the end of each cottage a lean-to was constructed, divided by a partition-wall into two portions. Of this, the half facing south was the bedroom, the other half the shed for fuel, tools, and other articles, a necessary adjunct to every cottage. The advantages of this plan are great. The bedroom, which has a large south window and a boarded floor, is a comfortable little apartment, opening into the sitting-room. It is manifestly valuable in case of illness, or of a woman lying in, the fire in the sitting-room warming it, and the person sitting up at the fireside being in immediate communication with the bedroom, without having to carry things up and down stairs. When not wanted by an invalid, the ground-floor bedroom is convenient for the boys of the family; and, lastly, when not wanted by the family, the ground-floor bedroom enables a lodger to be taken without injury to the privacy of the house. This last consideration is very important. Out of consideration for the morality and decency of families, lodgers are prohibited in many cottages. This results in young men being compelled, when they leave their family home, either to marry at once, or else to lodge at a public-house. The wretched discomfort of this last alternative drives decent young men into matrimony when hardly out of their teens, and before they have saved any money to begin life with. If they could as lodgers help the family expenses of some respectable small family, and at the same time not be a nuisance and injury to their hosts, the benefit in every way would be great; and this, the third bedroom on the ground-floor makes practicable The staircase in such cottages should be alongside of the fireplace in the front sitting-room, hence the only access to the back bedroom, where the daughters of the family are supposed to sleep, would be through the bedroom of the master and mistress of the house. Under these circumstances, any evil result from taking a lodger seems to be effectually provided against. I have long felt the great value of the ground-floor bedrooms, and several pairs of cottages on the plan exhibited have been built in years past on the Cranmer Estate. Experience has justified the high opinion I have formed of the plan. If the third bedroom be obtained by building an external shed, and carrying up the walls to the top of the cottage, the advantages I have shown to belong to the ground-floor bedroom are lost; while the expenses of construction, owing to the extra joists for the floor and the increased cost of a high-pitched roof, is considerably greater. The increased expenditure of such an arrangement was calculated by Mr. Boardman, the able and experienced architect who assisted Lord Walsingham and myself in deciding upon the best among the many plans sent in to compete for Mr. Pratt's prize, as at least 20*l*. The cost of these prize cottages we could not exactly state in the present unsettled cost of labour and materials; but the plan being simple and cheap, they ought not to exceed from 230*l*. to 250*l*. the pair, thoroughly well built with brick or concrete, or claylump faced with brick walls. The two latter description of walls are warmer and dryer than brick, owing to the porous nature of Norfolk brick, which even in a 14-in. wall lets through a good deal of damp on the east and west gable ends. The object of this paper is to lay before the section what seemed to me to be a convenient, economical, and simple solution of the problem, *How to construct a labourer's cottage with three bedrooms.*

## THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

On Saturday last the second meeting of the Lancashire and Cheshire district committee was held at the Town-hall, Manchester, under the presidency of Mr. Lynde, C.E., city surveyor. The meeting was attended by the surveyors of all the principal towns in the neighbourhood, including Manchester, Salford, Bolton, Blackburn, Birkenhead, Barrow-in-Furness, Stockport, Warrington, &c.

The unanimous thanks of the meeting was voted to the Mayor of Manchester for his kindness in placing a room at the Town-hall at the disposal of the meeting.

After a short discussion on matters of professional interest, the members drove to the works of the Salford new intercepting sewer, now being constructed from the designs of Mr. Fowler, C.E., Salford, by whom the plans and details were explained. Afterwards, under the guidance of Mr. Lynde, they visited the Manchester abattoir, and wholesale meat markets; the sanitary depôt; and stables, where upwards of 250 horses employed by the various departments of the corporation are kept.

The new townhall was then visited, and finally the central fire station and police courts. It is almost unnecessary to say that the members present were highly pleased with their visit, no pains had been spared by Messrs. Lynde & Fowler, to ensure the pleasure and convenience of their visitors; and in addition the visit to the central fire station, opportunely occurred at a moment when an alarm of fire was raised, and the visitors had the satisfaction of seeing two engines turn out with a full complement of firemen, and with two horses to each, all ready for duty, within one minute and a half after the alarm signal: of course Mr. Tozer, and his well-trained assistants, were complimented on their promptitude.

In the evening the members of the Association dined together at the Queen's Hotel, when a vote of thanks was passed to Messrs. Lynde and Fowler, for their exertions during the day.

The Association of Municipal Surveyors is comparatively a new institution, and is gaining a good position amongst sister societies. Our readers have often heard of it through the medium of our columns. Attempts have previously been made to establish such a society, but, until the present year without success, when, thanks to the example of the town-clerks and medical officers of health, this association has been formed.

It has been found convenient to form through-

out the country committees of local surveyors within a convenient distance of each other, and with this intention the counties of Lancaster and Chester have been grouped together; upwards of thirty surveyors of the chief towns in both counties are members of the association of whom upwards of twenty were present at the meeting in Manchester.

We understand from Mr. R. Vawser, C.E., Warrington, who acts as hon. sec. to the committee, that the next meeting will be held early in January, in Liverpool, when papers relating to sanitary and engineering science will be read.

## THE LATE MR. ROBERT EDGAR, ARCHITECT.

Mr. Edgar, whose sudden and quite unexpected death we mentioned in our last, was, after years of struggling toil, just upon the moment of turning the corner on the road to professional advancement. He was on the eve of starting for the United States, upon an engagement containing every promise of professional success.

Mr. Edgar leaves a wife and seven children,—the eldest, a girl, only thirteen years of age,—to mourn their loss. This large infant family is entirely unprovided for.

To aid him in the competition which elected him one of the architects of the London School Board, Sir G. Gilbert Scott thus spoke of him:—"Mr. Edgar was for twelve years with me, and had previously been thoroughly trained as an architect, and held, when I first knew him, a very responsible position. He is a man of very great taste and artistic skill, with a thoroughly practical and artistic knowledge both of Classic, Renaissance, and Mediæval, with very considerable skill in designing in either of these styles. He has a thoroughly practical knowledge of building, and the various practical arts and trades connected with it, as I have reason to know, from his having taken a very leading position in the direction of the works at the new Foreign Office, and of the external portions of the India Office, under me."

For the Wedgwood Memorial Institute, Mr. Edgar obtained the first premium in the competition of designs, and subsequently carried out the work.

The deceased gentleman was a native of the Lowlands of Scotland, and it was an expression of pride with him that his family had been tenants on the same estate for the long period of 600 years, and were tenants still. As far as can be at present ascertained, he was in the 36th year of his age.

## THE PROPOSED NEW VEGETABLE MARKET.

At the last meeting of the court of Common Council of the City of London, the Markets Committee brought up a report recommending that the committee should be authorised to advertise for plans and estimates for the construction of a new fruit and vegetable market, pursuant to the order of the court of the 18th of September last.

Mr. Rudkin moved the adoption of this recommendation.

Mr. Deputy H. L. Taylor suggested that the committee should advertise for designs, giving premiums of 300*l*., 200*l*., and 100*l*. for the first, second, and third designs respectively, as in the case of the construction of the New Meat Market at Smithfield.

Mr. Rudkin adopted the suggestion, and the report was adopted, the court not pledging itself to entrust the work to the author of any design sent in.

## ARCHITECTURE AT LONDON UNIVERSITY.

The first of a course of lectures on "Architecture as an Art" was delivered by Professor Hayter Lewis at the University College, Gower-street, on Tuesday last. After giving the students some practical suggestions as to the best method of taking notes of his lectures, the Professor said that architecture could be distinguished by its mouldings, carvings, and masonry, by which the approximate date of its construction, and the people by whom it was constructed, could be ascertained, just as geologists are enabled to tell the age of the various strata of the earth by certain distinctive appearances in them. Greek, Roman, Norman, and other styles of architecture are as distinguishable as are the fossils of the earth. There were no complete chains of progress in architecture. Each country had a style, with a feeling and expression peculiarly its own. Wherever the people of a country went, they constructed their buildings after their own fashion; and although they might borrow some of the ideas from another nation, they were always altered. Though there is no complete gradual change, there is a succession of steps, as it were, one form succeeding another, and to a certain extent these steps may be traced. It will be found, as political power advanced, so also did architecture, and in reading the changes of architectural forms one is partially reading the history of the world. The progress of architecture, like civilisation, has been from south and east to west and north. A writer, in describing the rise of architecture and civilisation, says that men originally met together in huts, and by their fires, lighted by the rubbing of dried branches, they conversed together, and gave each other ideas; and from the copying of the nests of birds and the caves of beasts, they gradually became builders, and constructed harbours, &c. As there are differences in opinion in the rise of civilisation, so also are there in the rise of architecture.

Referring to the pre-historic remains of architecture, the lecturer said that their traces might be seen in all lands, and from their variety they were classified. One class was called *menhirs*; they were long stones, erect and isolated, like obelisks, one of the largest of which is in Karnak, Brittany, 63 ft. by 14 ft. diameter. Cleopatra's Needle is also an example, 67 ft. by only 8 ft. diameter. Another class was called *cromlechs* by the English, and *dolmens* by the French. They consist of two or more upright stones, supporting a cross one at the top: there is a specimen at Kits Cotty House, near Maidstone, the largest stone of which is 12 ft. by 9 ft. 3 in., and 2 ft. thick; at Lockmariaker, Brittany, with a stone 18 ft. by 12 ft. by 4 ft.; at Bagnieux, with a stone 24 ft. by 14 in. by 2 ft. 9 in.; and one at L'Angresse, Guernsey, in which was a sepulchral urn, &c. In India and the east side of Jordan, many were also to be found. The third class are circles of stone, which are to be seen in Brittany, the Orkney Islands, and Stonehenge. The greatest of all is at Stonehenge, which consists of four circles. Palsgrave, who travelled into the interior of Arabia, where but few European travellers have been, says that he came to a circle, formed of trilithons, which was precisely the same as at Stonehenge. He (Mr. Palsgrave), to give an idea of the height of the stones, stood up in the stirrups of the horse he was riding, and was just able to reach the cross stone. He was told that there were two other similar circles to the one he described. Others have been recently discovered near Mount Sinai. Pre-historic traces may be seen in Phœnix Park, Dublin, Guernsey, Etruria, the Holy Land, Algiers, Brittany, and other places.

What, then, was the object of their construction? There are an enormous number of them, and they are to be found in places where their existence would not be thought probable. The *dolmens* have been considered the remains of altars, and their form suggests that idea. Another view is taken by some persons, who say that they are simply the entrances to houses, that they form a doorway, and that the houses were made by loose stones and wood, which having been destroyed, the skeletons, the doors, remain. It might have been so in some cases; but in other instances it would be absurd to say it was so, for there is no way through them. Respecting circles, one idea is that they were made to surround the tumuli; another is that they were built for places of assembly; another for temples, which idea is supported by Inigo Jones; a more recent suggestion, however, is that of Mr. Fergusson, that they were the spots marking the position of conquering armies in the time of King Alfred. He believes that many of these stone monuments are of comparatively recent date, and in this view is supported by Mr. Knight. In support of this idea it is said that no mention is made by Cæsar of the existence of these edifices; that support is, however, soon cut away by the fact that they are not mentioned by Bede. There are only a few marks upon them, and no inscription, so it is impossible to fix the date of their construction. The lecturer said he would sum up in the elegant words of Palsgrave, who, speaking of the great circles found in Arabia, said wherever they were found they were grand old monuments, and all record of "their speechless past is gone for ever."

## HEALTH AND LEGISLATION.

In the address to the Social Science Association, made by the president of the Health Section, Capt. Douglas Galton, F.R.S., the speaker said, a brief allusion to some of our sanitary shortcomings at home forms an almost necessary prelude to the question of the sanitary provisions required in the General Building Acts. Mr. Simon, the head of the medical department of the Local Government Board, stated recently that the deaths which occur in Great Britain are fully one-third more numerous than they would be if our existing knowledge of the chief causes of disease were reasonably well applied throughout the country. We learn that there is a yearly average of 120,000 deaths from causes which may be termed preventable; and when we consider that the larger proportion of individuals attacked by these preventable diseases recover, and that a small proportion only die, it is oppressive to think of the enormous amount of human suffering and waste of human life which these figures represent. The deteriorating effect of residence in towns has been frequently brought before the public by this Association. The Registrar-General has shown that an urban population of 8,250,000 persons living on 2,150,000 acres showed an average death-rate of 25 per 1,000; whilst a rural population of 9,750,000 living on 350,000,000 acres showed an average death-rate of only 17 per 1,000. The number of the population which inhabits towns is largely increasing. At the beginning of the century the population of the metropolis was 958,863; no other town contained more than 100,000 inhabitants, and only five of the principal towns exceeded 50,000 in population; but such has been the increase in the town populations that in 1871 the population of London had reached 3,266,987, and there were above 40 towns with a population exceeding 50,000 inhabitants, of which 17 exceeded 100,000 inhabitants. Dr. Morgan, in his able paper on the deterioration of races in great cities, shows that of the adult population of London 53 per cent., of that of Birmingham 49 per cent., of that of Manchester 50 per cent., and of that of Liverpool 62 per cent. were immigrants from the country settled in the town, and that the majority of the incomers were men and women in the prime of life. The mortality in these four towns averaged 26 per 1,000 against 19 per 1,000 in the country districts; the mortality of persons under the age of 15 being 40·7 per 1,000 in these towns, against 22 per 1,000 in the country districts. The marriages in the city population were four times as numerous as in the agricultural counties, but the births in the town population only exceeded those in the agricultural population by one-sixth. In an inquiry not connected with sanitary questions, Mr. Francis Galton made a careful statistical analysis of the details of 1,000 town families and 1,000 country families selected from the town of Coventry and the adjacent agricultural population. The result shows that a town population supplies to the next generation only three-quarters of the number of adults supplied by an equally numerous country population, and that in two generations the adult grandchildren of artizan townsfolk are little more than half as numerous as those of labouring people who live in healthy country districts. In large closely-built centres of population the ratio would probably be considerably increased against the town population. For purposes of comparison, the health of the country population may be quoted as superior to that of towns, but the standard of health in the county districts is far lower than it should be. Much, no doubt, has been done; for instance, ague, which was so common near London that James I. and Cromwell both died of that disease in London, is now almost unknown in that locality, and is of much rarer occurrence throughout England generally in consequence of improved drainage and agriculture. Vast sums have been spent in the water supply of towns, and great efforts are being made to deal with the sewage. But the fact still remains that with a large expenditure in these directions, there is scarcely a town which does not contain numerous foci of disease. There is scarcely a village which is not overdowing with sanitary defects. The Report of the Royal Commission on Agricultural Employ-

ment observes:—"The majority of cottages which exist in rural parishes are deficient in almost every requisite that should constitute a home for a Christian family in a civilised community." We must raise the standard of health in our rural communities, and endeavour to approximate the health of our towns to that improved standard. But were all measures of healthy construction and healthy conservancy adopted in houses and workshops in towns, there would yet remain atmospheric impurity as an important source of deterioration to the health of inmates of towns; and from this cause a town population must be less healthy than a rural population enjoying equally perfect sanitary arrangements. Unfortunately, whilst we are ready to admit the desirableness of sanitary improvements, we are very averse to pay for them. The municipalities of most towns possess sufficient powers for levying rates for sanitary improvements; but in many towns the local authorities neglect either to put existing powers into operation, or to obtain necessary new powers. Many private proprietors leave the sanitary defects of their houses and cottages comparatively uncared for. The principal requirements are:—First, the immediate removal of organic matter from places where, by putrefaction, it can contaminate the air, the water or the food; secondly, the supply of pure water; thirdly, the sufficiency of breathing-space allowed to each individual. In places where many dwellings are congregated together, these requirements may be classed under two heads,—viz., first, those that are common to the community, such as the supply of good water, the removal of foul water, and the removal of refuse-matter; and, secondly those which immediately concern the individual householder. Every step in sanitary improvement means the expenditure of money. Each town or village is subject to local conditions which influence the choice of the process to be adopted. I would only observe that where the conditions admit of sewage irrigation, its application forms the most effectual means of purifying sewage and of obtaining from it all its fertilising properties; but sewage should be applied to land rapidly after its formation, and never allowed to stagnate on or in the land. Legislation cannot fix a precise mode of clarifying sewage for universal adoption. But there is now no want of knowledge of how to dispose of sewage. The law lays down the principle that the proceedings of one individual shall not become a nuisance to his neighbour; and if in the case of pollution of streams the courts of law invariably inflicted severe penalties, the pollution of streams by sewage would soon cease to exist. Pure water is an essential element in the prevention of disease. Each town or village is subject to its own special conditions, and no absolute standard of purity for water can be laid down. Well-water, fit for drinking, contains more or less of mineral or other matters derived from the soil. All river-water should be filtered before being used for domestic purposes, and it should be kept covered after filtration. But if pure water is not otherwise procurable by the individual inhabitants of a town or village, it should be the duty of the local authorities to provide it. After referring at length to the Building Acts, and the necessity of submitting all plans of new houses to the local surveyor, the speaker continued:—It will be seen how very little the law can directly do to remove or prevent practical sanitary defects. The most effectual methods of inducing the people of this country to appreciate the value of sanitary knowledge would be, to select as medical officers of union districts and boards of health men of sound sanitary education, not given to theories, to whom should be intrusted the prevention as well as the cure of disease. They should consequently be sufficiently well paid to make the service attractive to good men, and to be enabled to commit a large portion of the mere drudgery of the office to duly-qualified assistants. To insure the necessary knowledge, a special education is required. This might be afforded by the establishment in universities or hospitals of chairs or professorships of practical hygiene; and their certificates of practical skill should entitle the possessor, when acting as a medical officer of a sanitary area, to receive a defined sum from the Local Government Board out of Parliamentary votes, of such an amount as materially to improve the emoluments of medical officers who had thus qualified themselves. The conclusions which I would desire to impress upon you are—1. That so long as so much preventable disease exists in this country we must not delude ourselves with the idea that we have done more than touch the borders of sanitary improvement. 2. That the first step in further progress is to imbue the owners and occupiers of houses and cottages with a knowledge of the laws of health. 3. That to assist in disseminating this knowledge the position and emoluments of the medical officers of unions should be improved, so as to enable them more usefully to watch over the prevention of disease. 4. That in every town and village, or congregation of houses, rates levied on the owners or occupiers should be employed to provide—1. A supply of pure drinking-water within the reach of all the inhabitants. 2. Drainage, so as to insure that all fouled water would be removed rapidly, and not allowed to stagnate on the surface, or to pass into streams until it had been clarified. 3. The immediate removal of all refuse from the immediate vicinity of dwellings. 4. That the plans of all new habitable houses and important alterations of existing houses over the whole country should be subject to a general Building Act, containing provisions such as I have enumerated above, enforced by the local authorities. 5. That whenever the local medical officer has reason to suspect that a cause of disease exists in any house in a town or village, there should be a power to enter and inspect the premises, and to require the removal, at the expense of the owner or occupier, of any cause of disease found to exist. Government and Parliament cannot of themselves do what is required. Legislative measures are no doubt necessary to assist sanitary progress and to enforce sanitary discipline; but for real practical progress we must look to our own exertions. Laws can do but little unless aided by the earnest, the strenuous co-operation of every individual member of the community.

## THE WORKS AT THE HOLBORN VIADUCT EXTENSION RAILWAY.—OPENING OF THE NEW CITY TERMINUS STATION.

A few weeks will suffice to see the opening of another large and important metropolitan railway terminus, situated in one of the busiest City thoroughfares, and equal in extent to those at Charing-cross, Cannon-street, and other portions of the metropolis. The extensive works between the Holborn Viaduct and the Ludgate Hill Station which have for more than two years been in progress by the London, Chatham, and Dover Railway Company, with the view of having a first-class City terminus on the Viaduct, are now very rapidly approaching completion, and are so far advanced that the opening of the extension line to Holborn has been definitely fixed for the 1st of December at the latest, although it is not improbable that it will be opened about the middle of November. Every effort is now being made to accomplish this object, and we understand the contractors have confidence in being able to have the works ready for traffic by the earlier-named period.

The extension line commences near Messrs. Cassell & Co.'s printing works, where the junction with the existing line is effected, and is there carried forward in the direction of Holborn, on the high level, by a series of brick arches and massive iron girders. The brick arches are built both upon the east and west sides of the present line, which descends by a rapid gradient from Ludgate until it arrives at a low level under Holborn, and the iron girders are carried over and across the old low-level line, the girders being arched between each other, the large new station area being formed of the space above the brick arches and that over the railway below covered in by the iron girders and arches just described. Close to the point of junction near Ludgate six lines of rails radiate right and left from the existing line, and are carried forward into the new station at Holborn. There are thus three double lines of rails within the station, between which there are four spacious platforms, 445 ft. in length. The central platforms are 20 ft. in width each, and the east and west platforms 14 ft. In addition to the six lines of rails already named, there is also another line on the extreme east side in connexion with an engine-shed, and a large tank, which has just been erected, and also another line on the west side for the shunting of trains, making eight lines altogether. A new signal-house, considerably above the level of the new line, has just been erected near the point of junction, midway between Ludgate and Holborn, commanding a view of the two stations. It is a substantial structure, standing upon six iron columns, 15 ft. in height, with iron cross-girders. The several platforms within the station, which are faced with asphalte, have been laid down, and the ballasting of the line, and the laying down of the metals between Ludgate and Holborn is now in progress.

The roof of the station is also nearly completed. This structure, which is 325 ft. in length, and 140 ft. in width, consists of three bays. It is supported on the east side by resting on the eastern boundary wall of the station, and also by twelve iron columns, running along each of the central platforms, with an equal number of iron columns on the west side of the station. Light iron segmental arches and cross girders rest upon the capitals of the iron columns, and the roof is covered in partly by glass, and partly by wood. The iron columns supporting the roof are 22 ft. in height to the capitals, and the extreme height of the roof is 35 ft. The whole of the interior is now in process of decoration. The columns are painted in cream colour, whilst the capitals, as well as the girders, are in pale blue and red, the wood-work of the roof being in white, and the rafters in a delicate yellow or primrose colour.

Large and commodious parcel-offices have been erected on the west side of the station, upon arches or pillars carried up to the railway level. These offices, which have a frontage of 150 ft. in length, are three stories in height, and contain a large number of apartments and conveniences for carrying on this department of the company's business. There is a spacious area in front of the entrance to the parcel-offices, the whole of which, together with the space running the entire length of the western platform, will be set apart as a cab-rank. There are three large entrances into the parcel-offices inside the station, immediately on the west side of the cab-rank, and the approach to both the latter and the offices will be in Farringdon-street, and thence through Bear-alley, along a circuitous incline forming a portion of the works which have been erected, and by which the railway level leading to the parcel-offices, and also to the cab-rank, is arrived at. The outlet for the cabs, when leaving the station either with or without passengers, will be under an archway on to the Viaduct. This archway will be erected at the west side of the station buildings and offices having their frontage to the Viaduct.

In addition to the four platforms running north and south, to which we have already alluded, there will also be a main cross platform at the north end of the station similar to that at the Charing-cross station, and reached through the booking-offices from the Holborn Viaduct frontage, which architecturally will be the main feature in the works. The elevation of this frontage, which includes a fine hotel, will be 235 ft. in length from the east to the west, and 70 ft. in depth to the main cross platform. The whole of the ground-floor is intended to be exclusively set apart for the booking-offices, waiting-rooms, and other apartments for the purposes of the company, together with a spacious restaurant and refreshment-rooms at the east end of the building, which will be conducted by Messrs. Spiers & Pond. The booking-offices and hotel will extend to the entire width of the station, and the west end of the structure will be built on strong and massive iron girders carried over the present old low-level line. The restaurant and refreshment-rooms will occupy a width of 53 ft. at the east end of the elevation, the rest of the ground-floor of the building forming the booking-offices, waiting-rooms, and the rest of the company's offices. The works at this point are of an unusually heavy character, deep excavations for the foundations and basement having occupied a considerable amount of time and labour. In that portion at the east end which is intended for the restaurant and refreshment-rooms there is both a basement and a sub-basement. The basement, which is 22 ft. in depth, is arched over, and the ground-floor of the booking-offices immediately above is supported by girders and columns. There is a deep basement in the whole of the building to the point on the west side where it will be carried up on girders over the present low-level line. The booking-offices, which will be approached by two entrances in the centre of the elevation, will be 55 ft. in width and 35 ft. in depth, and the ground-floor of the building will contain, in addition, on either side, one first-class gentlemen's waiting-room, 25 ft. by 20 ft., and a ladies' first-class waiting-room of the same dimensions, besides several second-class waiting-rooms, and

other apartments, including a large cloak-room, station-master's office, booking-clerks' rooms, telegraph-office, lavatories, &c. The ground-floor portion of the elevation, forming, as we have already stated, the company's offices and the restaurant, with the exception of the western portion, has been carried up almost to its intended height. The material used in this part of the intended building is Portland stone, rusticated. The windows are 5 ft. in width, and 9 ft. in height. They are circular-headed, and ornamented with sculptured figure-heads for key-stones. The entrances are bold. On each side there are piers of large size, and the extreme width to the outside of the piers is 9 ft., whilst the width of the doorways is 5 ft. There are fluted pilasters with elaborately-carved capitals on each side of the entrances. Immediately above the ground-floor, running the entire length of the elevation, is a balustrade.

The hotel, which is intended to be erected in continuation of the ground-floor of the Viaduct elevation, has not yet been commenced, but is shortly to be proceeded with. In the meantime it may be stated that the building is not to be erected at the expense of the railway company, but is the undertaking of a distinct body of proprietors. Mr. Isaacs, of Verulam-buildings, Gray's-inn, is the architect, and a sketch of the intended structure may be interesting. The building will be of large proportions. The style of architecture partakes of the Italian. It will extend the entire length of the ground-floor elevation,—235 ft.,—and will be 87 ft. in height from the street level to the apex of the dormers, whilst at the east and west angles there will be towers or turrets, harmonising with the general architectnral character of the structure, and rising to a height of 100 ft. above the Viaduct. The building will have four lofty floors above the railway company's offices, in addition to dormers, whilst above these again in the roof of the building is a floor consisting of servants' dormitories, with circular windows. The balustrade above the company's offices is immediately at the foot of the first-floor windows of the hotel. The windows of the several stories at each end of the elevation are segment- and pediment-headed. There are fluted pilaster and capitals between each window. There are also similar pilasters, with carved capitals, carried up from the first floor to the top of the third-floor windows, and there surmounted by a bold projecting cornice. Immediately above the first-floor windows a band, in ornamental terra-cotta work, is carried across the building, whilst in front of the foot of the second-story windows there is an iron balcony. The dormers above the fourth story are uniform with the windows in several other portions of the elevation, being pediment-headed, and in the centre there is a large triplet window, surmounted by a large sculptured figure. Between each of the dormers there is a balustrade. The entrance to the hotel will be at the west end of the building.

The works in progress, in addition to those already described, include the erection of another new station on the north side of the Viaduct, opposite to the intended station and hotel. It is to be called the Snow-hill Station, and is intended to give increased accommodation to the inhabitants of that immediate district travelling between Ludgate, Farringdon, King's-cross, and also for the accommodation generally of the Metropolitan, the Midland, and the Great Northern Companies, whose trains run in connexion with the London, Chatham, and Dover Company. The station will be erected on a level with the Viaduct, standing upon four strong iron girders thrown across the low-level line between Holborn and Farringdon. There will be four entrances to it from the Viaduct, and also from the Snow-hill side, the new railway platform below being reached by a staircase from the offices of the new station above. It will also be connected with the high-level station on the opposite side of the Viaduct by a second staircase communicating with the latter. The line has been widened to the extent of 150 ft. in length on the north-west side of the Viaduct, so as to admit of the construction of the new platform in connexion with the station. The four girders upon which the new station will stand are expected to be in their places next week, when the erection of the superstructure will be proceeded with.

The whole of these extensive works (the hotel excepted) have been designed by Mr. Mills, the chief engineer to the Chatham and Dover Company, and are being carried out under the personal superintendence of Mr. Jones, the company's assistant engineer, and Mr. Rowell, the general manager in charge. Mr. Webster is the contractor for the whole of the works.

## ST. PAUL'S CATHEDRAL WEST AREA IMPROVEMENTS.

After a considerable number of preliminary communications had passed between the Corporation of London and the Dean and Chapter of St. Paul's at various times relative to throwing back the railings for the purpose of improving the roadway in front of the cathedral and at the top of Ludgate-hill, a definite proposal was made by the City in 1867, and the surveyor to the fabric was desired to report upon it to the Dean and Chapter and the trustees of the fabric fund. After due deliberation, and with the concurrence of several artistic and professional friends, he reported that simply to throw back the railings would, in his opinion, so much confine the space as to be inadmissible; but if the whole area to the west of the cathedral could be thrown open, a great improvement would be effected.

This recommendation took the form that if the City would pay a suitable price for such land as they threw into the roadway, the Dean and Chapter should undertake the works required upon the rest of the area, which it was obvious would involve a very serious outlay. This report was favourably received by Dean Milman and the Chapter, and by the trustees of the fabric fund; and the question then turned upon the amount of land to be given up to the roadway, and the amount also of the compensation to be paid by the Corporation. The proposal, however, seemed to lie dormant for about two years, when it was re-opened by a letter from Mr. Hayward (who had never lost sight of it) addressed to Mr. Penrose, which ultimately led to the matter being settled, and the works which are shown in our engravings being carried out.

The land given up to the roadway is over 7,000 superficial feet; the amount to be paid by the Corporation to the Dean and Chapter is 15,000*l.*; but the latter will have to expend about 6,000*l.* on the improvement, including the renewal of the steps, which becomes necessary from their being made the chief access to the cathedral.

The remainder of the purchase-money, moreover, will be expended in various ways on the cathedral, and brings no private advantage to the Dean and Chapter. It should be stated that the Dean and Chapter invited a committee of the Royal Institute of British Architects to consider the matter, which met and recommended the retention for the cathedral of a somewhat larger area than had been intended.

The Dean and Chapter, whose only object was to make a great public improvement, and who were quite willing to forego the larger amount of compensation, agreed with the recommendation of the architects' committee, and for about a year the negotiation was delayed by an endeavour on the part of the Chapter to obtain the adhesion of the Corporation to this view. But when it appeared plain that no progress was to be made, and the question only being whether the open space should be within the Dean and Chapter's boundary or outside it, it was thought undesirable to delay a great public improvement on a subordinate question, and a plan was finally prepared by the surveyor of the fabric, and agreed to by the Dean and Chapter and the Corporation. This plan, which is now being carried out, is shown in the corresponding engraving.

After thus increasing the roadway by about 7,000 ft., as already stated, a space is laid out westward of the cathedral, of the form of a semi-ellipse, accurately worked from calculated ordinates; the major semi-diameter of the curve lies westward, and extends to 114 ft. in front of the cathedral, and the smaller diameter, 168 ft., extends from the northern to the southern tower. The area thus inclosed is upwards of 15,000 ft., and will remain the property of the Dean and Chapter, but the public, *i.e.*, pedestrians, will have access to it at all times, excepting only that on the occasions of important services in the cathedral it will be inclosed temporarily by barriers fixed to the granite posts which mark the boundary, to diminish the pressure of the crowd from the doors, and at night the upper part of the staircase and the portico will be protected by an iron fence of a suitable pattern, which is so contrived that by machinery concealed in the vaults it can be raised or lowered at pleasure, two workmen, one above and the other below, being sufficient for this operation. The groove through which the rail passes is covered by a narrow bronze flap.

The reserved area before mentioned extends to about 9 ft. westward of the railing of the Queen Anne statue, and the Corporation have moreover agreed to form round and outside of the entire boundary a paved footway, 6 ft. wide, which will be elevated by the usual curb above the roadway. The whole area within the curb will be flat, the sills on which the posts stand being flush with the footway just mentioned and this flat surface (it is not absolutely level) will extend throughout up to the steps leading to the cathedral.

The sill supporting the posts is of Aberdeen granite, 2 ft. 4 in. wide. The posts, which are of the dark red granite from the Shap Quarries in Westmoreland, are polished, and are ornamented by a deeply-sunk neck moulding for the purpose of attachment of the temporary barriers already described. The posts are generally 1 ft. 5 in. in diameter at the base, tapering in the shaft (3 ft. 6 in. high exposed to view, and about 1 ft. 6 in. sunk in the solid concrete and granite curb), and are 7 ft. 3 in. from centre to centre, or about four diameters apart, excepting that two larger openings, which are defended by larger posts, are formed to give carriage access to the west front for the royal, civic, and other dignitaries on the occasions of great festivals. These may be seen by reference to the engravings. The paving in front of the great steps is formed with panels by means of granite bands, 11 in. wide, the intersections being marked by octagons, and the filling-in where the carriage access is intended is of strong granite blocks, and the remainder for the most part is formed out of the old Purbeck pitching, a large portion of which was found to be sound and hard, and has been carefully reworked and gauged for the purpose.

The statue of Queen Anne, the care of which presumedly rests with a Government department, will have to be very considerably restored, as will also the fence round it, unless, as is more likely to be done, the fence is removed entirely, and as we have shown in our engraving.

The plan shows a circular pathway round it, to be formed with radiating slabs of granite circumscribed by a margin of the 11 in. granite, similar to the divisions of the panels.

The steps forming the great flights in front of the portico are formed of black Guernsey granite, which the surveyor has been at much pains to procure in the proper scantlings, having personally visited the quarries in the island for that purpose. These take the place of the old black marble, now much disintegrated. The material is very durable. They were worked in lengths at the quarries, and afterwards rubbed on risers by the cathedral masons.

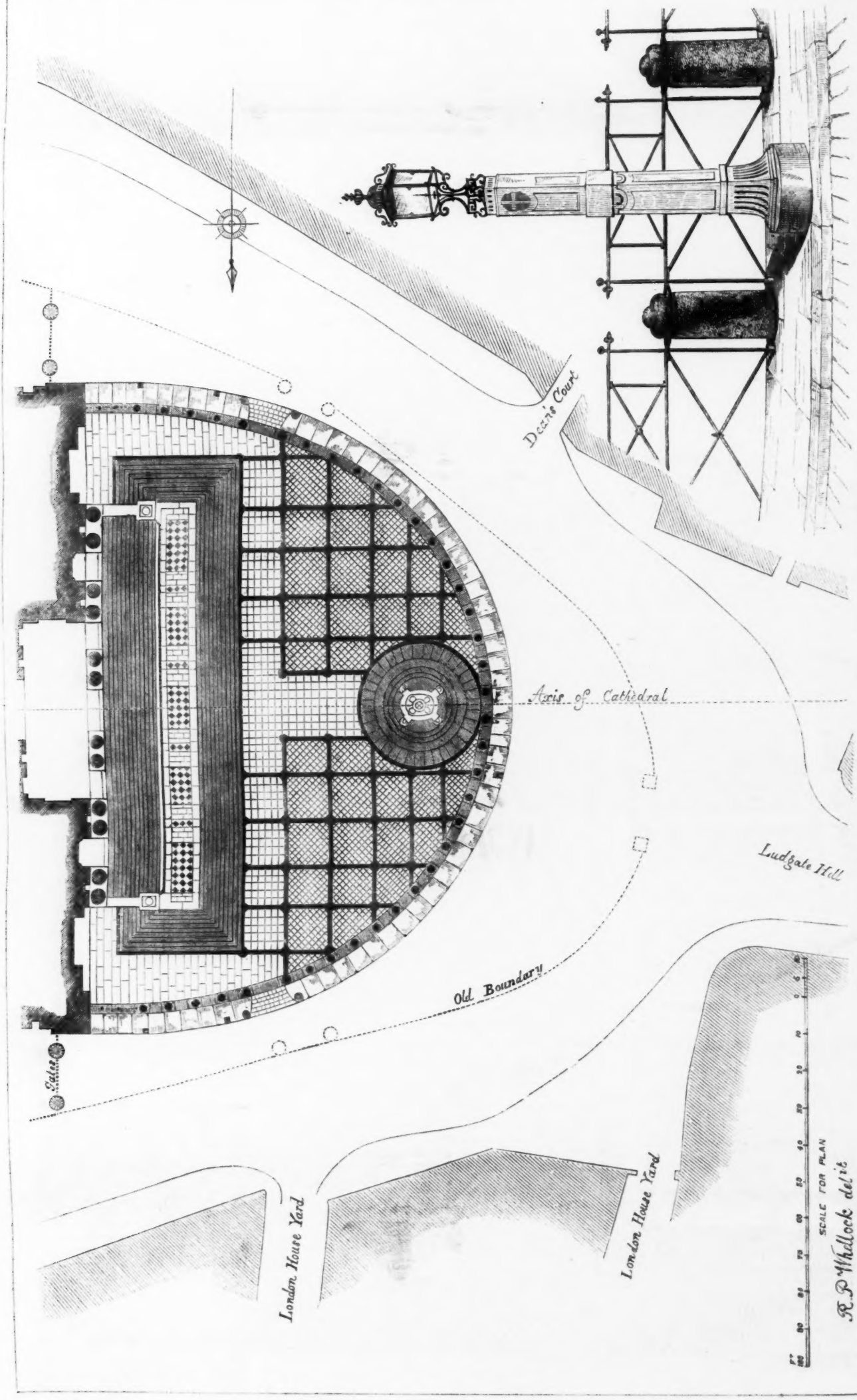
Mr. Penrose has designed the lower flights with returned ends, as shown on a plan by Sir C. Wren himself, in the possession of the chapter. The landing will be paved with marbles of different kinds, consisting of a margin of Sicilian, enclosing panels of squares, arranged lozenge-wise, of black and red, the latter being from the revived Rosso Antico quarries.

The lamp-posts are ten in number, two for the pedestals, for which open iron or bronze scroll-work designs are contemplated, and eight for the area, for which granite posts have been proposed, and a study at large for one of them is introduced in the plate; but none of them have as yet been finally settled.

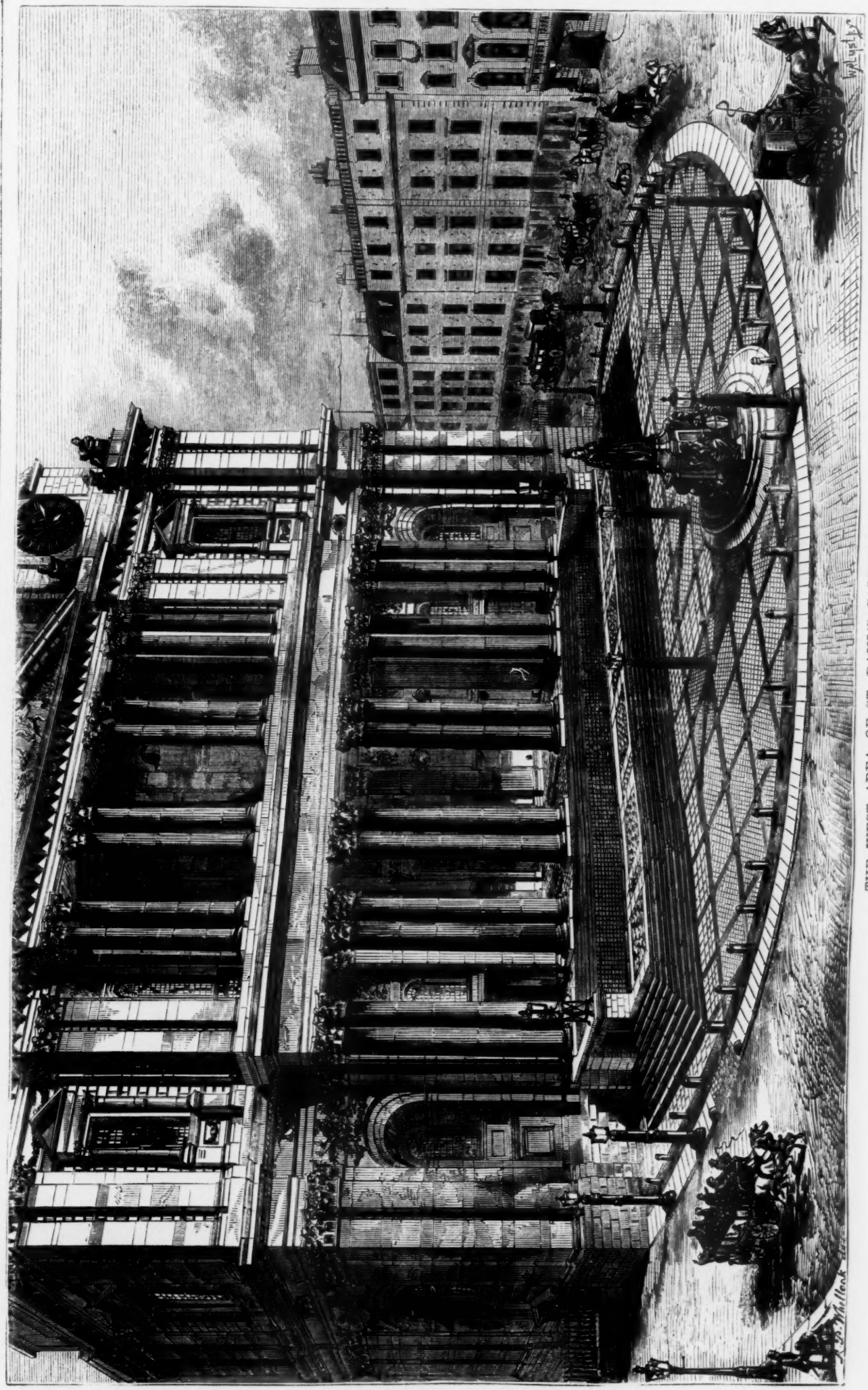
The works have all been designed by the cathedral surveyor, and carried out under his superintendence by Mr. Wilkinson, the cathedral clerk of works, and the regular staff of workmen, with such temporary assistance as the occasion has required.

The contractors for the materials supplied are as follow, viz.:—Messrs. Duguenin & Hamley, of Guernsey, for the granite steps; Messrs. Manuelle, of Seething-lane, London, being the agents, and who also supply the Aberdeen granite curb; Messrs. Freeman, of Westminster, for the slabs of carriage-way and the intersecting bands, &c.; Messrs. Fenning, of Cornhill, for the Shap granite posts; Messrs. Field, Poole, & Sons, for the marbles of landing; and Messrs. Cubitt & Co., of Gray's-inn-road, for the moveable iron railings.

The progress which has been made in the whole makes it probable that, before the year draws to a close, the outer railing will be removed, and a great improvement, and one which Sir C. Wren would have desired (for the railing, as executed, was not after his ideal), will be offered to the public eye.




ST. PAUL'S CATHEDRAL: WEST AREA IMPROVEMENTS.



THE WEST AREA OF ST. PAUL'S CATHEDRAL.

## A PILGRIMAGE TO WREXHAM AND ITS VICINITY, NORTH WALES.*

An architectural pilgrimage a century ago to the grand old church in the "trim Wricksam towne, a pearle in Denbighshire," now recognised as the town of Wrexham, would have afforded an intellectual treat of no small value; however, when the substance cannot be obtained the shadow must suffice.

The history of a Mediæval church is always more or less romantic or poetical, a peculiarity appertaining to Roman Catholic times, when superstitions were preferred to the holy Scriptures; but the architecture of the old churches, based upon scientific knowledge, always affords a truthful history, open to reason, and not requiring the aid of fancy.

The local guide-book informs tourists that Wrexham "has no history, relative or individual, and that its origin is involved in obscurity," and it was anciently famous for its buckler-makers, and to-day it is famous for its good ale. The good ale appears to have been of no mental benefit to the town in former times, as the maltsters ejected a popular Welsh curate for preaching against intemperance. The guide-book must not be unkindly criticised, as its writer, a solicitor, modestly undertakes "to concentrate only that which floats upon the surface of the current literature."

The three finest Perpendicular churches in North Wales are St. Giles's, Wrexham; All Saints', Gresford; and St. Mary's, Mold. These churches contain superior work; the first is very gorgeous externally, with a tower of the Somersetshire kind, and is confessed to be the glory of North Wales. This church consists of a tower, nave and aisles, north porch, and a polygonal apse at the east end, all being finely proportioned. The nave is separated from the aisles by octagonal columns, with moulded capitals and bases; the arches are plain and chamfered. The nave has a clearstory, with windows in two-lights cinquefoiled. The timber roof is open, of low span, with rafters and moulded tie-beams, and knees supported by stone corbels, with angels bearing shields; there is a lower range of corbels, which, perhaps, originally carried vaulting shafts. The spaces between the rafters are subdivided into squares, with smaller squares and narrow intersecting ribs, with bosses at the intersections. The pulpit stands on the north side of the nave, by the east end; it is modern, and of an octagonal form, having niches filled with the figures of our Lord and the Evangelists, and enriched with marble shafts and much carving. It cost 200*l*. The pulpit formerly stood two compartments westward of its present position, against one of the columns on the north side. The font is ancient, octagonal, with water-drain, and of good proportion; it has been rechiselled, and placed at the west end of the nave. For many years it was in the garden at Acton House, misused as an ornamental basin. The arch between the nave and tower is lofty, and supported by numerous attached clustered columns, with moulded capitals and bases.

The western window has five cinquefoil lights, with trefoil-headed mullions in the arch. A large painting of King David, said to be by Rubens, hangs on the south wall, near the tower. It was brought from Rome by Elihu Yale. There was formerly a painting of the royal arms. The organ is at the west end, under the tower. It was reconstructed in 1853. The pipes are placed on each side, so as to expose to view the west window. In front of the organ-gallery and the arms of Queen Elizabeth, carved in wood. The organ, at one time, the only one in the diocese, except St. Asaph, was built by Green, of London, in 1779, and cost 300*l*., which was raised by subscription. At the west end of the nave is an elaborate Gothic mural monument, in Bath stone, to Sir Foster Cunliffe, bart.,—date, 1834. The lectern, at the east end of the nave, is of brass, in the form of an eagle, with wings expanded. It has an inscription, stating that Ino. ap Gryffyd, of Plas-y-Stewart, bequeathed it in the year 1524. An old MS. says that it cost 6*l*. A carved oak reading-desk stands at the east end of the south side.

The nave and aisles are paved with encaustic tiles. The huge galleries which were placed in the aisles in 1820 were, with all the high pews on the ground-floor, removed in 1867. The present oak seats were then put in their stead, and the church was "thoroughly cleaned, and warmed by an apparatus running along the floor. Until then, in recent times, it was heated by four large stoves, one at each corner of the church. This event of 1867 is called the Restoration. At this time the walls were chiselled, and the process disclosed some dauby paintings." If the editor of the guide-book had referred to the *Builder*, vol. xxv., p. 824, he would have found that during the process of cleaning the walls from the successive coats of whitewash some very interesting remains of mural painting were brought to light, the most important being portions of the representation of the Last Judgment, over the chancel arch, the colours remaining in good preservation.

"At the Restoration," says the "Guide-book," "the faces of the lowest range of the corbels on the south of the nave were found to be composed of plaster of Paris, or some other cement. They were removed, and the present figures cut in the stone in their stead. It is to be regretted that these latter, whilst they are not 'restorations,' have no local pertinency; and though some of them are cleverly done, they have no other origin than the fancy of the artist." If this be correct, it would have been better not to have re-sculptured them.

The mural monuments are placed on the walls of the aisles, some having been removed from the chancel. On the east wall of the north aisle are three brass plates,—to the wife of Thomas Davies, 1736; Vincent Bradley, 1743; and John Wynn, 1796. There is a marble monument to the widow of John Fryn, 1817, by Richard Westmacott, of London. In the centre of the north wall of aisle is an elaborate monument to Mrs. Mary Myddelton, daughter of Sir Richard Myddelton, of Chirk Castle, date 1747. It is the work of Roubiliac, executed in white marble, and represents the resurrection of the deceased, obedient to the summons of a *Cupid!* A neat brass plate recording the lady's death would have been more appropriate and less offensive. There are also tablets in memory of Ursula Lloyd, date 1730; Edward Wettnall, timber merchant and carpenter, date 1766; Edward Smith, collector of Excise, 1757; Philip Paleston, 1776; Mary Davies, 1802; Frances Paleston, 1804; also William Johnson Edenson, 1829. Four mural brass plates complete the memorials in the north aisle,—John Williams, 1746; Christian Jones, 1747; Maria Ellis, 1786; and Elizabeth Moore, date 1797.

On the south wall of the south aisle are mural brasses to Jonathan and Mary Price, 1729; John Jones, of Llwynoun, 1740 and 1799; Evans, 1751; Ann Wilkinson, 1756; Penelope Jones, 1821; and Thomas Parry, of Llwynoun, 1845. There are also marble tablets to Edward James, 1749; Martha Foulkes, 1806; and John Foulkes, 1845. A stone slab let into the wall to the wife of William Poynton, 1746. At the east end of this aisle is a curious monument to Sir Richard Lloyd, of Esclusham, 1676, a judge and friend of Charles I.; and a classic monument to Owen Bold, 1703. An elaborate Gothic tablet to Alexander Murray, 1835, completes the monuments in the south aisle.

The windows in both aisles, excepting at each end, have obtuse arches. They are in four lights, with trefoiled heads and trefoil-headed lights in arches. In the south-east angle of the north aisle is a large bracket, moulded and carved. In the south aisle, in the south wall, at the east end, is a small cinquefoiled-headed recess. In the angle of the aisle at this end is a rich canopied niche.

In 1820, the date being on the outside, the south aisle was lengthened westward, enclosing the south window of the tower and one of the buttresses. This has shortened the external appearance of the tower on this side, and forms a clumsy addition. There is a settlement between the old and new work and the corbels to the external label of the new window have never been sculptured. It was proposed, in 1867, to erect a "north chancel aisle," to receive the organ. This would have destroyed the symmetry of the apse. At this end of the aisle, on a framed board, are the arms emblazoned of John Trevor, 1682.

The roofs of the aisles are lean-tos, principals and knees moulded, the latter supported by stone corbels, spaces panelled. The two tattered banners in the aisles are the old colours of the 42nd regiment, and bear, amongst others, the names of Alma and Inkermann.

The chancel floor is two steps above the nave, and the altar pavement is raised two steps. The chancel is polygonal, and forms an enlargement of the original church, not a modern but Mediæval addition. The east ends of the body and aisles were originally in a line. The present chancel arch was formerly the east window, which has been opened to the floor level. The tracery in head is left in a broken state. On each side is a canopied niche. At the east ends of the north and south aisles, were formerly chantry chapels, enclosed by screens; the entire wall surfaces on the north side were originally powdered with *fleur-de-lis* and other devices. The former chancel was limited to two bays or compartments of the body of the church, which accounts for the windows at the east ends of the aisles having more acute arches, with four lights, the central mullion at the springing, diverging, and forming two inner arches. The east window of the chancel is pointed, and in five cinquefoiled lights, transomed, and contains a pictorial history of the "Life of our Saviour," in painted and stained glass. A painting, said by Brown Willis to be a Titian, formerly hid the east window, and was sold for 9*l*. The side windows are in four lights, with cinquefoiled heads. The windows in the two angles, are in three trefoiled-headed lights, filled with painted stained glass, St. Peter in one window and St. Paul in the other, date 1867. On the south side are three sediliæ, with canopied heads, cinquefoiled. Beneath the window is a recumbent stone effigy of Hugh Bellot, in his canonical robes, Bishop of Bangor and Chester, date 1596. He was employed by Queen Elizabeth in translating the Bible, and would not have a female servant in his house. On the same side of the chancel is a white marble monument to William Lloyd, of Plas Power, date 1793. On the north side is a marble monument to Fitzhugh, date 1784, also a mural marble monument to the Rev. Thomas Myddelton, by Roubiliac; and a monument to the wife of Archibald Peel.

The reredos, or altar-screen is in five canopied compartments, cinque-foiled. There is a small doorway under the east window. The floors of the chancel and altar are paved with encaustic tiles, and stalled with oak seating on each side.

Of the exterior of the church, the tower, clearstory, aisles, and chancel are embattled; these, with two pinnacles of the tower, have been rebuilt; the cornices are ornamented with sculptured figures and pateræ. The tower is a study of itself; it is mostly panelled; the buttresses and the bands or strings are also panelled. Between the angle buttresses on each side are three projecting square shafts, commencing from a string just above the west window, and terminating with crocketed pinnacles above the embattlements. On each shaft are three sculptured statues of saints, about thirty in number, in canopied niches. Amongst them is that of St. Giles, to whom the church is dedicated. The guide-book says that "two of the niches are deserted of their saints, who, one day walking from their pedestals to take the air, fell down, and were broken." The buttresses are in six stages, with gablets surmounted by pinnacles. Rising from each angle of the tower is a hexagonal canopied turret. The belfry windows are canopied, in three lights, transomed and foiled. The windows of the two lower stages are canopied, in two lights, transomed and foiled. The ground-story windows are pointed and labelled, in three lights, cinque-foiled, with trefoil-headed tracery. The west doorway has a pointed door, with square hood moulding, and is otherwise plain. The tower forms a noble feature, a study of itself, and it would be well if the Institute of Architects were to offer its silver medal for the best measured drawings of it,—a far superior subject than poor "Temple Bar." The stone staircase is in the north-west turret of the tower, and leads to the belfry, which contains ten bells, cast by Rudhall, in 1726. They were conveyed up the Severn to Shrewsbury, and thence transported by hand. The total cost of founding, carriage, hanging, &c., was 450*l*. 17*s*. 8*d*. The weight of the largest bell is 28 cwt. The little bell (the parson's bell) is one of the old peal, and was cast in 1678. Amongst the former peal was a large bell from St. Asaph Cathedral inscribed Dicas Boddlewiddan.

The exterior of the chancel is more ornamental than the body of the church, there are canopies to the windows, and the buttresses have crowns in full relief on the set-offs. All the pinnacles, including nave and aisles, are panelled, crocketed, and placed diagonally on the buttresses. There is a settlement in the east wall of the chancel. The basement mouldings around the church are nearly obliterated.

* See vol. xxii., p. 719; vol. xxiv., p. 609; vol. xxvi., p. 719; and vol. xxix., p. 829.

In front of the north porch over the doorway, is a canopied niche containing mutilated figures of the Virgin and Child.

In 1331 the spire of the former church was blown down, and the church itself was burnt in about 1457. The present edifice is in the Perpendicular style of architecture; the nave was built in 1472, then the north aisle, the south aisle next, and lastly the tower, in 1506, as indicated on the inside. The windows are glazed with glass from Normandy; they were reglazed in 1810 and 1811. The height of the tower is said to be 135 feet.

In 1645, Cromwell converted the church into a stable for his horses. In about 1815 the churchyard was enclosed by an iron railing, at the cost of 380*l*. There was formerly a lych-gate on the site of the iron gates next the street on the north side of the churchyard, incorrectly called a porch in the guide-book. When excavating for the standards of the iron gates, a stone effigy of an armed knight was discovered, with a couchant dog or lion at his feet. The shield is charged with a lion rampant, and has "*Hic jacet ap Howell*" inscribed on it. This figure is now placed in the north porch of the church in an upright position. There are several curious and interesting memorials in the churchyard; but as they are not of an architectural character, the guide-book is more suitable for them. The pinnacles and cornices of the south side of the church have been much disfigured by the smoke emitted from the numerous maltsters' chimneys on this side of the town, which lie at a lower level.

The town is reputed healthy, which is to be attributed to its situation. Its sanitary condition is imperfect.

Wrexham contains two churches and twelve chapels, a town-hall of the time of Henry VIII., an infirmary, savings-bank, provincial insurance company, grammar school, and others, and as these have been noticed, and some of them engraved in the *Builder*, from time to time, they do not require further notice. In the vicinity of Wrexham are several interesting mansions,—Brymbo Hall, a design of Inigo Jones; Eiddig Hall, containing heraldic bearings of the Royal tribes of Wales, and a valuable collection of Welsh manuscripts; Trevalyn Hall, date 1576; Pen-y-bryn, the residence of Beech in Boswell's "Life of Dr. Johnson"; an old house called Bryn-y-ffynnon, formerly a convent, recently altered; Plas-Grono, the birthplace of "Nimrod," of *Fraser's Magazine*; and many other places full of literary interest.

Of churches, there is Gresford Church, "restored" in 1867, with eight Knights Templars on the top, and Henry VII. in a niche on one side. In Holt Church, recently "restored," the floors of the pews were recently strewed with, not rushes, but straw. In the churchyard is a yew-tree 1,400 years old, and 26 ft. in circumference. Samuel Warren, author of "Ten Thousand a Year," was born in the parish.

A local or district guide-book, concisely prepared in chronological order, the early authorities culled, and recent knowledge added from personal visits, would be very useful and instructive to tourists. It would be well in compiling the manual to omit all funny epitaphs, small talk, and poetical effusions, however creditable to their authors, and satisfy the reason and not the feelings; dry matter of fact is all that is required; and the more urgently so, as at the present time it is the fashion to destroy all that is old, clear away or remove monuments out of sight, and to call the act a "restoration." For the future it would be all that is necessary to limit the internal memorials to brass plates let into the wall or floor; all churches, including St. Paul's and Westminster Abbey, having been much mutilated and disfigured by nonsensical marble monuments.

W. Pettit Griffith, F.S.A.

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**Society of Engineers.**—The first meeting of the Society of Engineers for the session 1873–4 was held on Monday evening last, the chair being occupied by the vice-president, Mr. W. Macgeorge. On that occasion a paper was read on recent improvements in pumping-engines for mines by Mr. Henry Davey, of Leeds. The author prefaced his subject with some observations upon the main objects which should be kept in view in designing steam machinery. These were economy of construction, of maintenance, and of fuel, upon each of which questions he offered some practical remarks.

## INDIAN ENGINEERING.

Under the title "India and Indian Engineering," three lectures delivered at the Royal Engineer Institute, Chatham, in July, 1872, by Julius George Medley, Lieut.-Colonel Royal Engineers, Assoc. Inst. C.E., and Principal of the Thomason Civil Engineering College, Roorkee, &c., have been published by Messrs. Spon, of Charing-cross.

In these able and interesting lectures some idea is given of the physical features of India, its climate, its people, and of the peculiarities of Anglo-Indian life. The author then proceeds to say something of the Government, and the great Department of State by which public works are executed, and of the special duties and probable career of the Royal Engineer officers who are there employed; and passes on to the materials and modes of construction with which the engineer is called upon to deal, and those specialities which distinguish his work from English practice.

Of the state of the arts and manufactures in India some judgment may, as the author remarks, be formed by an inspection of the beautiful specimens collected in the Indian annexe of the International Exhibition.

Some of the once famous Indian manufactures, he states, have almost disappeared in modern times, such as the Dacca muslin, of which it was said that a full-sized dress-piece could be drawn through a finger-ring. Native architecture, too, of the present day is tawdry and meretricious. But Cashmere is still famous for its wonderful shawls, in which we know not which to admire most, the beauty of the fabric, or the exquisite patterns and harmonious contrast of colours; Agra still executes that beautiful inlaid stonework, which is yet only one of the wonders of the Taj Mehal; Delhi and Benares send gorgeous embroideries, heavy with gold and rich in colouring; Cuttack furnishes its exquisite silver filagree-work; Sealkote, its steel inlaid with gold in arabesque patterns; Bombay, its massive and curiously-carved ebony furniture. But art can never attain to its highest development in the absence of a healthy national life, and it is to former ages we must turn for tructures like some of the Hindoo temples, or the great mosque at Delhi, or "the Dream in Marble" at Agra (the Taj Mehal), and even the artistic manufactures named are legacies from the past, that are apt to degenerate at the present day into a grotesque copying of European designs.

Yet there is an indwelling spirit of artistic grace in the East that will not easily die, which is seen in the instinctive choice of colours in the clothes of the very poorest on a holiday festival,—in the shape of the commonest earthenware utensils,—in the very salutation of the poorest peasant in the fields.

The work of an engineer officer in India, as in England, is of a very miscellaneous description. Every work is estimated for previously to sanction by the executive engineer, and the estimate, after being checked by the superintending engineer, is forwarded to his chief for sanction, who, if he approve the design and estimate, recommends it for sanction by the local government, or, in case of a large work, forwards it on to the supreme government with his own remarks. If not satisfied with it, he may return it for revision or explanation.

When a work is sanctioned and ordered to be commenced, the money being also forthcoming for it in the Budget, the executive engineer goes to work. In the large presidency towns, and a few of the more important stations, he may get the work executed by contract; but, as a general rule, he will have to be content with procuring his materials by contract, and perhaps getting his earthwork done in this manner. For the rest, he will have to employ daily paid labourers, and occasionally may have to import labourers from other districts, to organise them into gangs, provide them with tools, and arrange for their food, water, and temporary shelter. For this he has the assistance of his European overseers, native sub-overseers, and *mistrees* or head-artificers.

The European overseers are nearly all non-commissioned officers or privates who have volunteered from the various regiments in India for the Public Works Department, and have been trained at the Roorkee College. They are allowed to wear plain clothes, and are of course struck off all military duty. As a rule, they are hard-working, intelligent men, and many of them are most valuable subordinates, but they are generally deficient in practical knowledge, are not very conversant with the language, and are but too often given to drink.

The native sub-overseers have also been trained at Roorkee, and are generally good draughtsmen, surveyors, and estimators, but they are drawn from the trading instead of the working classes, have no practical experience, and lack physical stamina.

The *mistrees*, or native head masons and carpenters, are generally intelligent and good men, quick to learn and easily managed, but few have any theoretical knowledge.

The native labourer is patient, docile, and lazy, never drinks, and is easily managed by any one who understands him.

There are many varieties of stone in different parts of India, and it is employed in the various forms of ashlar, rubble, &c., very much as it is in Europe. Granites, limestones, and sandstones are extensively used in the localities where they occur, but the cost of carriage over bad roads to distant places necessarily restricts the employment of this material. In Southern India, laterite, a clay-stone, is extensively used, being easily worked, and becoming hard by exposure to the air. In Upper India, Delhi and Agra are famous for their red sandstone, and Jyepore for its white marble, of which the Taj and other famous buildings are constructed. Bombay has also many varieties of stone, notably the Poreebunder limestone. Allahabad has some fine quarries of sandstone, of which the new Government Buildings have been constructed, and Colonel Medley recommends to notice the account of the working of the Purtarpore Quarries, in the professional papers on Indian engineering, as giving much practical information. Slate is generally scarce and inferior, but some fine quarries have lately been opened out at Dalhousie, and in the Khuttuck Hills, in the Punjab.

There is a kind of soft stone called moorum, found in Central and Western India, which, though almost useless as a building material, is extensively employed for road metalling. Kunkur, too, is quite an Indian speciality, though it is almost entirely confined to the north-western provinces. It is a peculiar kind of oolitic limestone, found in beds just below the surface, and is of two kinds: one adapted for building purposes, in which it strongly resembles artificial concrete; the other answering admirably for road metalling, for which purpose it is broken into lumps about the size of an egg, drenched with water, and then rammed until perfectly smooth, after which it is allowed to dry before the traffic comes on it.

The manufacture of artificial stone by Ransome's process has been tried at Bombay on a small scale, but not with success in an economical point of view.

In the greater part of Upper India, and over much of the rest of India as well, *brick* is the chief building material, and there are few engineers in India who will not have much to do with brick-making. The lecturer therefore strongly recommended his hearers to make themselves well acquainted with the latest improvements in the art, at the same time bearing in mind certain Indian specialities, which will limit the use of many of these methods. These are the cost of carriage, the general absence of coal fuel, the dearness of other fuel, the absence of skilled subordinates, and the disinclination of natives to be driven out of their own customs, and to try experiments.

There is plenty of good brick-earth to be found, but the cost of carriage prevents the same care being taken as at home in the selection and admixture of clays. The clay is often tempered by hand, and then taken straight to the moulding-table; but pug-mills are now pretty common, worked by bullock power. The bricks are usually sand-moulded, and are made of the English size, and stacked in temporary sheds to dry. Brick-making machines have occasionally been tried; but their expense, the difficulty of repair, and the cheapness of hand labour, have always driven them out of the field. Hollow bricks, too, are never seen; and as the author thinks they would be found to be much cooler in the walls of buildings than solid bricks, he would recommend any one to acquire information of their manufacture and cost.

Coloured bricks are nowhere used in India, and their absence is much to be regretted, for they would be most useful both for architectural ornamentation and for floors and similar purposes. The proper clays, on which the colours depend, are found in some parts of India; and careful search would doubtless bring to light

others; but here again we are met by the fact that their manufacture requires skill and capital, which are not found on the spot, and would have to be imported. The same remark applies to terra-cotta and encaustic tiles, which would be admirably adapted for Indian use.

Good ordinary bricks are generally procurable in India, if only proper care be exercised, and a fair price paid for them. The bricklayers require close watching, and often systematic instruction in the all-important subject of bond; for the common native brick is very small, and laid in quantities of mortar with little care about bond; so that native walls are really masses of concrete.

Tiles are extensively used in India for roofing purposes, and they are often very badly made.

The subject of limes and cements is a very important one in India. Lime is obtained from the limestone boulders found in hill torrents, from kunkur, from beds of marl, or rather calcareous tufa, and from limestone *in situ*. It is burnt with wood fuel, sometimes in the open, generally in conical kilns, and is mixed with sand, burnt clay, or brick-dust, and sometimes other ingredients, to form mortar in the usual way. The best lime is that procured from boulders, which when mixed in the proportion of one part lime to two parts of *soorkee*, or pounded brick, forms an excellent mortar for hydraulic works. Kunkur lime, as a rule, is simply mixed with sand. When lime is burnt with *oopla*, care must be used in sifting and separating it from the ashes of the burnt fuel, otherwise, of course, its strength will be greatly impaired. Artificial cements have scarcely hitherto been made or used in India.

Concrete is not very much employed, though it has attracted a good deal of attention lately; and some of the works on the new Sirhind Canal were designed to be built almost entirely of it, such as arches of 40 ft. span. Indeed, with an abundance of excellent lime, and a great scarcity of fuel, it seems curious that it has not been more extensively used. Concrete blocks were recommended for the great weir over the Ganges, by the Ganges Canal Committee, to be composed of shingle, sand, and lime; and if proper apparatus be used for testing the quality of the lime, there seems every reason to anticipate economy and good work from such a mode of construction.

Lime is also used in stuccoes and plasters much as in England. Madras is noted for this work, where the very beautiful *chunam* plaster for interiors of rooms, is as smooth, hard, and polished as marble. Coarse sugar and pounded egg-shells are mixed with these more expensive plasters.

Of timbers there is an immense number in India occasionally used; but practically engineers are restricted to a very few varieties, which are the only ones procurable in any quantity. In the Punjab, for instance, the deodar (*Cedrus Deodara*) is the principal wood employed, being nearly identical with the famous cedar of Lebanon. It is found in the Himalayan forests. In Burmah and Western India, teak is the principal wood; its many excellent qualities are well known. Other common timbers are the mangoe, used only for planking or furniture, and readily attacked by insects; the sissoo or sheeshum, a hard, strong, but crooked wood, in general request for many purposes, especially furniture, as it takes a beautiful polish; the keekur or babool, an acacia, a very hard, tough wood, much used for carts; the famous Bombay black-wood, of which some beautiful specimens of carved furniture are to be seen in the Indian Court of the International Exhibition; the toon, an inferior mahogany; the sandal-wood, which has a strong perfume; and many others.

Timber in India is generally seasoned by the air or water process, and is occasionally kyanised or Burnettised. Well-seasoned timber stands the climate well if carefully protected from white ants, those pests of the East. For this purpose, the ends of beams fitting into walls are generally charred and tarred, or the timber is soaked in a solution of sulphate of copper; but the best preservative is carefully to prevent any earth or mud from coming in contact with it. Wooden posts buried in the earth will very soon be useless.

The Indian carpenters are generally very fair, and sometimes very clever workmen, though they *do* squat on the ground, and hold a piece of wood with their toes while they work the drill by means of a bow and string with their hands.

Wages, of course, vary more or less; but the pay of a common labourer all over India may be fairly set down at 2 annas, or 3d. a day, and of an ordinary mechanic at 6d. to 7½d., with which he finds himself in everything. A *beldar*, or navvy, will get 4½d., and a skilled carpenter or mason from 9d. to 1s. These wages seem very low compared with English prices; but the men all do far less work than an Englishman; thus, the lowest estimated rate of common earthwork is now about 5s. per 1,000 cubic feet, which is at the rate of 50 cubic feet only per day for each man of the gang employed.

Good ordinary brickwork will cost about 40s. per 100 cubic feet; ashlar, about 2s. per cubic foot; timber-work, 7s. per foot, "wrought and put up."

Taking into consideration the price of food, and other things, Colonel Medley reckons the difference in the value of money employed in constructing public works in India and in England as 1 to 4, *i.e.*, that a work costing 10,000*l.* in India would cost 40,000*l.* in England.

We had been led by the accounts of some recent works to a different opinion.

## THE MARGATE DRAINAGE COMPETITION.

The town council of the borough of Margate have had a lively time of it lately in their frequent discussions upon the subject of the borough drainage; meeting after meeting, now of the corporation, again of the committees, then of the burgesses in common hall, has been held, and the whole subject has been debated *pro* and *con.*, with the result that might have been expected, viz., the determination to do nothing until compelled. Nearly three years ago the resolution was put and carried in the council-chamber,—"That the time has now arrived when the borough ought to be drained," and immediately afterwards another resolution to stop the progress of the question, even after a leading engineer (Mr. Bazalgette) had been consulted thereon, was carried by a small majority, and nothing has been done beyond mere effortless talking, and a few excursions at the public expense, by a "Drainage Inspection" Committee, until, awakened by a most damaging report forwarded by the medical men practising in the town to the Local Government Board, the corporation were goaded into action by the appearance of Dr. Gwynne Harries, the Government medical inspector, in their midst.

Dr. Harries met the corporation at the town-hall on the 3rd of April last, and quietly told the council that the cesspool system in the town was totally inadequate to absorb the deleterious emanations of the sulliage, and that some machinery must be organised very promptly for the purpose of effecting the drainage of the entire town, and the prompt abolition of the cesspools. The corporation rated roundly the medical men who had stirred up the subject, grumbled at the medical inspector, and finding remonstrance and even statistics of no avail to ward off any longer the *per force* interference of the Government, they reluctantly, and in a very half-hearted manner, determined,—not on draining,—but on taking professional advice. Within a month,—so hotly made they haste,—they had had three or four meetings upon the subject, when it was at length discovered that the contours of the 10-ft. Ordnance plan, obtained several years since, did not extend into the newly-built districts. Here was a chance to put off the matter. If an engineer were employed to design works of drainage he would have to take the levels of these districts himself,—a work of some weeks,—and the expense would be formidable; but if competitive plans were called for, each competitor would have to do this for himself, and the expense would be enormous. In vain was it elicited from the borough surveyor that he could in six weeks run and check all the necessary levels, and place 300 copies of the town map upon the Board-room table at an expense of under 50*l.*; and in vain did Mr. Councillor Sear, himself an architect, indorse the borough surveyor's opinion that it might be done easily within the specified time, for the corporation apparently did not want to go on,—the work was distasteful—the cesspools were good—the medical staff were wrong—the Government inspector was prejudiced—the town did not require draining—the corporation did not like Government interference,—and, therefore, a motion "That nothing further be done until the Ordnance Survey of the borough be completed, and their plans supplied," brought forward by Mr. Alderman Reeve, who had previously been thwarted in his special scheme for getting a sewage irrigation farm just near the borough boundary, found nine ready supporters in a meeting of twelve, and the nine went their way considering that they had effectually shelved the question for an indefinite time to come. But the Ordnance Office at once sent men and obtained the necessary levels, and called in photography to their aid, and, probably two years earlier than if they had had to wait for the work of the *burin* of the engraver, photographed plans were produced, and early in July last a photographed plan of the town, with every level, and the most minute detail, was forwarded in twelve small sheets from the Ordnance Survey Office, accompanied by an intimation that copies might be had at 14s. 9d. each. The corporation were taken aback. Here was the very plan placed before them which was not expected to appear until some conveniently remote period, and a motion "That the necessary steps for forwarding the drainage of the borough be now proceeded with," met only with a feeble opposition. Debates warm and prolonged have followed,—one professional adviser—a limited competition—an open competition—all in turns have been advocated, and the discussions have resulted in a sort of compromise—a general invitation to submit to a selection of ten (*vide* our advertisement columns), and the conditions of the competition are now before us. A motion to invite six of our leading engineers to forward plans, and to give each of the six the sum of 50*l.* for his labour, fell through, and it was eventually decided to offer the sum of 300*l.*, in two premiums, among ten competitors, whom the corporation propose to select from the list of names which will be submitted by engineers, who are willing to go into this limited competition, and who have had more or less previous experience in sewerage and drainage works. Seeing that the number of tenements in the borough is stated as being under 2,500, the amount of premiums to be awarded seems to have been conceived in a liberal spirit, and we believe in the sincere desire of the corporation, who are greatly agitated by two opposing parties in their midst, viz., the sewage farm and the anti-sewage farm advocates, to adopt that scheme which may appear most likely to lead to a satisfactory result. Margate is as poor as she is popular, and any error in judgment among her rulers, in hastily venturing on the expense of a scheme that might in the long run prove inefficient, and necessitate the double expense of having the work done over again, would ruin the townspeople most effectually. They can well afford to pay for a success in this particular, but they cannot afford to pay for experiments, and would be crushed by a failure. Brighton, we are told, spent 85,000*l.* on a system supposed to be perfect, but which failed, and then a further expenditure was incurred of 80,000*l.* to amend the works. Dover and Worthing, too, and Hastings are instances of the same error. Let the corporation of Margate take heed lest they also follow these unfortunate precedents. Meanwhile Merthyr seems to have succeeded in the direction of a profitable and innocuous sewage farm (Dr. Alfred Smee's letters to the *Times*, notwithstanding), and the Margate Sewage Inspection Committee, whose instructions direct them to "visit towns which have the reputation of being effectually drained," cannot consider their labours as completed until they shall have visited this last example, and made their report upon the applicability of the system to the peculiar requirements of Margate. None can accuse the local authorities of precipitancy in this important matter, seeing that it has been for at least ten or fifteen years under discussion: act now they must.

## DEATH OF SIR EDWIN LANDSEER, R.A.

This great artist died on Wednesday of last week in London. Deceased was the youngest son of the late John Landseer, A.R.A., the well-known engraver, and was born in London in 1802. He excelled in the painting of animals even while a boy, and became a student of the Academy in 1816. He began to exhibit when little more than fourteen years of age, and his earliest productions attracted attention, and gave great promise of future excellence. His "Chevy Chase," at the age of twenty-three, made him an Associate of the Academy. Among the best known of his numerous pictures are the following:—"Dignity and Impudence"; "Jack

in Office"; "The Old Shepherd's Chief Mourner"; "A Distinguished Member of the Humane Society"; "Saved"; "Alexander and Diogenes"; "A Highland Breakfast"; "The Drover's Departure"; "The Dog and the Shadow"; "A Fireside Party"; "There's no Place like Home"; "The Twa Dogs"; "Tethered Rams"; "Sancho Panza and Dapple"; "The Angler's Guard"; "Suspense"; "Comical Dogs"; "Young Roebuck and Rough Hounds"; "The Eagle's Nest"; "War" and "Peace"; "Bolton Abbey in the Olden Times;" "Titania"; "Laying down the Law"; "The late Duke of Wellington, accompanied by his Daughter-in-law, visiting the Field of Waterloo." In 1858 he exhibited "Deer-stalking," the first of his large drawings in chalk, which have since become so popular; in 1859 his picture of "Doubtful Crumbs," and "A Kind Star"; in 1860 his "Floods in the Highlands"; and in 1861 "The Shrew Tamed"; with three large drawings in chalk; and more recently "Windsor Park," "Squirrels Cracking Nuts," and "Man Proposes, but God Disposes,"—a scene in the Arctic Regions. The majority of his compositions have become popular as engravings. His grand bronze figure of the "Stag at Bay" was in the Royal Academy Exhibition of 1866; and the four lions in bronze for the base of the Nelson Column, Trafalgar-square, for which he received the commission from the Government in 1859, were placed on the pedestals and uncovered January 31, 1867. At the death of Sir Charles Eastlake, 1866, Sir Edwin was elected President of the Royal Academy. He refused, however, to accept the honour, and an adjournment for a week took place, in order to give him time for consideration. As Sir Edwin could not be induced to alter his determination, the presidency was offered to Mr. Maclise, who also positively declined it, whereupon Sir Francis Grant was elected.

Sir Edwin was knighted by her Majesty in 1850. Latterly his health, both of body and mind, was very much impaired. He lived and died unmarried.

## DISPUTED OWNERSHIP OF BUILDING LAND.

The Mile End Old Town guardians are at present engaged in a question involving an unusually knotty point as to the ownership of certain lands within their district. It appears that many years ago a certain property near the corner of White Horse-lane was purchased with the view to the establishment of a "North-East Metropolitan Asylum for Vagrants." The property was purchased by a committee composed of representatives of the various parishes and unions in this district of the metropolis, with money borrowed for the purpose. Mr. Kelday, one of the present churchwardens of the parish of Hackney, was appointed clerk to the committee of management; but, ultimately, owing to some unexplained cause, the scheme for the building of the asylum collapsed. The statement now is that Mr. Kelday claims ownership of the land under the plea of undisputed possession for twenty years; and what renders the case of greater interest to those concerned is the fact that Mr. Kelday has let portions of the land upon lease to persons who have erected extensive buildings upon it. In the meantime it appears that for a long period the Mile End guardians have challenged Mr. Kelday's legal claim to the property, and have been endeavouring to influence the higher authorities in favour of its sale, and a division of the proceeds amongst the parishes interested. The Local Government Board, as the direct medium of communication with the executive, are the parties to whom application has been made in the matter, and it is a communication in reply received by the Mile End Board from the first mentioned body, which is of grave and seriously important moment to those builders and others who have up to the present time taken leases and erected buildings on the property. The letter from the Local Government Board states that the solicitor for the Treasury has the matter still in hand, and it also further intimates that if persons have taken leases of portions of the land in question from Mr. Kelday, without first taking steps to ascertain as to whether he has a legal title to it, they will have to abide by the result of the inquiry now pending. There is, therefore, the chance of serious consequences to those who have built upon the land should there eventually be an adverse decision as to Mr. Kelday's legal claim. On the other hand, however, he may be able to establish it. At present the question remains in this position, that the Mile End guardians are still in communication with the Treasury on the subject.

## EXHIBITION OF APPLIANCES FOR THE ECONOMICAL CONSUMPTION OF FUEL.

The Society for the Promotion of Scientific Industry, Manchester, looking to the enormous waste there is in the consumption of coal, have resolved that an exhibition shall be held in Manchester, of all appliances and apparatus that tend to the economic use and saving of fuel, for the purpose of inducing attention to, and eliciting opinions of practical men on the matter, and of giving all consumers of coal an opportunity of comparing the various appliances, with a view to their adoption of that which will best serve their purposes. Exhibitors will be given every opportunity of explaining the speciality of their apparatus. Mr. W. G. Larkins, the secretary, will give any information desired.

## WHAT SHALL WE BUILD WITH?

Sir,—I think those architects who are anxious for the credit of the profession should take an opportunity of visiting Westminster Bridge, and look at what is going on within range of vision. At three important national buildings,—Lambeth Palace, the Houses of Parliament, and the Abbey,—scaffolding is up for repairing the stonework. At the Palace it may be ancient work that is being restored, but at the other buildings it is modern work of about twenty years' standing, or less.

Would it not be well for our architects in future to follow the example of their brethren at St. Petersburg, Aberdeen, and other places, and build with everlasting granite? Of course, greater simplicity of treatment would be necessary; but this would be an advantage rather than otherwise, considering the smoky atmosphere of London. H. T.

## NATIONAL MUSEUMS.

A standing committee has been appointed by the Society of Arts for the purpose of bringing under Parliamentary responsibility the national museums and galleries, so as to extend their benefits to local museums, and to make them bear on public education. It is desired to cause all national museums and galleries to be placed under the authority of a Minister of the Crown, being a member of the Cabinet, with direct responsibility to Parliament; thereby abolishing all unpaid and irresponsible trustees, except those who are trustees under bequests or deeds, who should continue to have the full powers of their trusts, but should not be charged with the expenditure of Parliamentary votes. Also to cause the Public Libraries and Museums Act (18 & 19 Vict., cap. lxx.) to be enlarged, in order to give local authorities increased powers of acting.

## BELGIAN RESTORATIONS.

Sir,—I have no intention of joining the crusade against restoration which is just now so fashionable, but I must call your attention to certain wholesale works of destruction which are being perpetrated under the plea of restoration in the Netherlands.

The Belgians have taken the "Gothic fever" from ourselves, and, although they have caught the complaint late in the day, they seem determined to make up for lost time, as nearly every important church in the land is undergoing a more or less extensive restoration. Now as these "restorations" generally consist in the destruction of everything in the church which is not Gothic, you may easily imagine the havoc that is being created.

No one can have a greater admiration for Gothic architecture than I have, but it is undeniable that the Belgian churches owe quite as much of their interest and picturesqueness to their costly and magnificent Renaissance fittings as they do to their original structural excellence.

Surely, sir, it is barbarous to destroy or remove such works as the rood-screen at Bois-le-Duc; the *whole of the fittings* of the great church at Courtrai; the statues of the Apostles and magnificent candelabra of the cathedral at Bruges; the marble screens of the cathedral at Ghent; and yet these and many other works of destruction are either actually accomplished or are being carried out.

I trust that you may consider this subject worthy of the attention of your valuable journal.

H. W. Brewer.

## THE WARMING OF SCHOOL-HOUSES.

Sir,—Your excellent notice of the opening of Creek-road School, Deptford, does me undeserved honour in naming me the inventor of one of the grates. These are all by Mr. Boyd, of Conduit-street, my share in the particular kind alluded to being limited to an endeavour to adapt and improve it for school purposes.

With the enormous price to which coal has risen, the warming of a school-room has attained the dimensions of a problem most difficult of solution. The open fireplace is the favourite method, partly from English habit and partly from its assistance to ventilation. It is attended to most irregularly. Under one kind of teacher, it speedily goes out; under another, it is kept up to roasting-point. In the class-room, it can have but one possible position, viz., the corner. In the school-room, it is hard to place well for equal diffusion of heat without being in the way.

Yet, for small school, say up to 600, it is the best method, provided the consumption of coal be economised, and the greater part of the heat be got into the room, instead of being, as is commonly the case, allowed to escape up the chimney. Several kinds of grates are being used in London schools, and the coming winter will afford some test of their relative and actual value.

It is doubtful at what point, as to numbers, it becomes more economical in first cost and annual maintenance to adopt what is called "artificial" warming. A school of 750 children is, perhaps, debatable land. When the numbers rise to 1,000 doubt is at an end, and the open fire has become the most troublesome as well as the most costly. E. R. Robson.

## THE CONTRACTS FOR GRANITE IN HACKNEY: SERIOUS CHARGE.

A grave charge was made against the contractors for broken granite at the meeting of the Hackney District Board of Works last week. The committee reported to the Board that, having considered the tenders received at the previous meeting for the supply of 3,500 tons of broken granite, they had decided to recommend that none of the tenders be accepted, and that the committee be empowered to make arrangements for a temporary supply. In the course of a discussion which followed, Mr. Eve, one of the members of the Board, stated that there was a general impression with regard to tendering for granite that, no matter how fair might be the offer made, it would stand no chance of acceptance; and that there was also an idea prevalent amongst the public out of doors that the price of granite was kept up by unfair combination amongst the contractors, and that it was the duty of the Board to take the first opportunity to break up such a clique. Mr. Green, another member of the Board, said he could confirm the statement that a feeling prevailed that it was useless for persons who did not belong to a certain coterie tendering for granite. If that should be found to be correct, it would form the ground for a very serious charge against the officers of the Board. Mr. Clark and another member added, that the statements made respecting combination on the part of the contractors for the purpose of keeping up the price of granite was founded on truth. The recommendation of the committee was adopted, and it was also decided to endeavour to defeat the so-called clique for keeping up the prices of granite.

## BUILDER'S CLAIM FOR MAKING PLANS AND ESTIMATE.

Maher v. Lipsom.—In this case, at Shoreditch County Court, reported in *Daily Chronicle*, before J. B. Dasent, Esq., Judge, the plaintiff, Mr. Denis Maher, of Well-street, Hackney, builder, represented by Mr. Fenton, solicitor, of Worship-street, sued the defendant, Mr. Lipsom, of the Clarendon Arms Tavern, Church-street, South Hackney, for the sum of 5*l.* 5*s.* for removing partition in the bar of the tavern, measuring up for proposed work at the same house, inside and out, giving professional advice, getting up specifications for the work, and valuing the same.

The evidence for the plaintiff was to the effect that he had been sent for by the defendant, to look over the house and bar, both exterior and inside, with a view to the renovating of the same, and then he was asked to prepare specifications, and furnish an estimate of the work, which he did, and employed another man to make the drawings, upon which an agreement was entered into that he should do the work at the price he had tendered; but the defendant departed from the agreement, and employed another person to do the work, on which plaintiff sent in his bill for what he had done, and now sought to recover the amount.

Mr. Willis, solicitor, of Charles-square, Hoxton, who represented the defendant, elicited, upon cross-examination of the plaintiff, that he was accustomed to send in estimates for building works he took in hand, when requested to do so, without expense, when the work was

given him to do; but he denied that the defendant had told him that he would invite tenders to be sent in for doing the work, though he knew that tenders had been sought for, and that several builders were making application to be employed in doing the work; and when Mr. Willis produced a letter sent by the plaintiff along with the estimate and specifications, the plaintiff admitted that he prepared the specification and plans in order to make his tender, and was told that his tender had been accepted, although he had never been asked by the defendant to sign a contract, and had never seen the defendant since until last Saturday, when the defendant altogether repudiated the demand.

The evidence of the plaintiff being deemed defective, the judge directed a nonsuit, on which Mr. Willis made application for costs, which the court granted.

## BUILDERS' ACTIONS.

### WILLIMORE *v.* LORD FAVERSHAM.

This was virtually an undefended action (Brompton County Court), but is one too common with builders and building tradesmen crediting persons of good position in life, who allow their bills to run for years, and when pressed for payment, dispute the charge.

Mr. Newman, solicitor, stated that his client was a glass and lead merchant carrying on business in the Brompton-road, and the defendant, Lord Faversham, resided in Knightsbridge, and the sum claimed was 6*l.* 4*s.* 11*d.*, for goods supplied and work done. He called John A. Farmer, who stated that he called on Lord Faversham, and spoke to him respecting a portion of the debt, *i.e.*, 5*l.* 3*s.* 2*d.* This was for two large plates of glass, which were ordered from witness, and supplied in the usual way. Lord Faversham then admitted the debt for the glass; but as he (witness) did not then know more was owing at the time, he did not bring it under his notice.

Mr. Newman had to call several men, who had left their work to attend the court, to prove that they fixed a number of sash-lines, and did other work of a similar nature, which was moderate at 1*l.* 1*s.* 9*d.*

Lord Faversham's name was called, and as he did not answer, the Judge (Mr. Serjeant Wheeler) gave judgment for the full claim, with costs of attorney and witnesses.

## CLIFTON ROAD SCHOOLS, DEPTFORD.

Sir,—In your notice of the opening of the Clifton-road schools, on Friday [3rd inst.], by the London School Board, which reached our office an hour after the event, you say that an anomaly comes out of the floor space for 385 square yards being devoted to infants and babies, as against 231 square yards to boys and girls. We wish to explain that the original purpose was to build for 220 boys, 220 girls, and 300 infants, but before commencing work, the Board determined that it would be most advisable to have a central hall for the district where 400 or 500 children could be assembled on occasion, and the Clifton-road site being most central, instructions were issued to adapt the plan for that purpose. Hence the anomaly of the extra large infant school. The gallery across the end is for visitors. Only two rooms are to be heated by Mr. Robson's stoves. All the class-rooms have ordinary fire-brick back stoves, with air chambers constructed in the setting of them. The large hall will be warmed by Gill stoves. There is teaching area for 940 children in these schools.

Elliott & Warren,
Architects of Clifton-road Schools.

## METROPOLITAN SCHOOL BOARD.

At the last meeting of the members of the School Board for London, the following recommendations of the Works Committee were adopted:—That the tender of Mr. J. Kirk, of Warren-lane Wharf, Woolwich, amounting to 5,279*l.*, for the erection of a school to provide accommodation for 787 children, on the Cayley-street, Limehouse, site, be accepted. That the tender of Mr. J. Kirk, of Warren-lane Wharf, Woolwich, amounting to 6,977*l.*, for the erection of a school to provide accommodation for 1,074 children, on the site in Belvedere-place, Borough-road, be accepted. That the tender of Mr. J. Grover, of Packington-street, N., amounting to 4,690*l.*, for the erection of a school to provide accommodation for 578 children, on the Penton-grove, Pentonville, site, be accepted.

## THE LIVERPOOL ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

A soirée, to commemorate the twenty-fifth anniversary of the establishment of this society, has been held at the Royal Institution, Colquitt-street. There was a large assemblage of visitors of both sexes. The museum-rooms were open from half-past six o'clock, and numerous objects of architectural and historical interest were exhibited. There was a great variety of architectural drawings and models, autotype photographs, and specimens of mechanical printing, exhibited by Messrs. Spencer, Sawyer, and Bird, of London. Japanese and Chinese works of art were displayed, and a stained-glass window, having upon it figures of Commerce, Industry, Peace, and Plenty, was exhibited by Messrs. J. A. Forrest & Co., of Lime-street. At half-past seven o'clock the company assembled in the large lecture-hall, when a short introductory address was delivered by the president, Mr. T. D. Barry. He referred to the origin of the Society, twenty-five years ago, when a meeting of architects was held at Claughton Hall, under the presidency of Sir William Jackson. From the date of the establishment of the society up to the present time it had continued to increase in numbers, usefulness, and prosperity. The architects of the town had been brought together in one common bond of brotherhood, and the result had been mutual counsel and information, which had been of great benefit to the members. Amongst other advantages which had resulted from the establishment of the society were the settling of a uniform scale of fees and great benefit to student members.

Mr. Edmund Sharpe, F.S.A., of Lancaster, then delivered a lecture "On the Cathedrals and Monasteries of England," illustrating his subject by the aid of the oxyhydrogen light. The subjects were arranged in chronological order, and included his six periods of English architecture from the Conquest to the Reformation, namely, the Norman, the Transitional, the Lancet, the Geometrical, the Curvilinear, and the Rectilinear.

At the close of the lecture the company adjourned to the exhibition and refreshment rooms. At a subsequent period of the evening they again assembled in the lecture-hall, when a short musical entertainment was given by some of the members and their friends.

## ST. BARTHOLOMEW'S, CHATHAM.

Sir,—Permit me to remark that,—1. Lepers invariably worshipped inside their own hospital chapel; 2. The lepers had their house, and therefore their beds, at Chatham, at a considerable distance from the chapel; and 3. That the "square openings" in the wall are simply the base and jambs of the south windows of the nave, which are not earlier than the twelfth century, and are high up.

These facts can be substantiated by documentary evidence. In hospitals or *maisons dieu* for the aged or sick, as at Chichester, the arrangement of a nave with aisles containing beds and a chancel on one plane, screened off at its upper or east end, was very different necessarily from that of a lazar house. What use the outer building at Chatham served is another question.

Mackenzie E. C. Walcott.

## THE FAILURE OF PORTLAND CEMENT.

Sir,—In answer to your correspondent, "A Sufferer," allow me to say that, in an article in the *Builder*, about four years ago, in answer to a correspondent as to the behaviour of Portland cement, I there laid the fault to the manufacturers, and not *one* at that time contradicted it, stating that they ground it and sifted it too coarse, and in a busy time sent it out too fresh. The precaution I take is to have the cement in three weeks before using. Shoot it out of the sacks into a bin, under cover, and expose it to the air, and sift *all* for fining and finishing coats through a sieve, whose mesh is twenty holes to the lineal inch. Finishing all weatherings, and, where practicable, in *one* coat, and if done in the *hot* weather, *be up in the morning and give the work a good wetting* with a watering-pot or syringe, as the rays of the sun extract the moisture before it has time to harden.

The sand should be well washed, and free from all organic matter, and the *best* cement only used: *good* cement should weigh over 1 cwt. to the strike bushel.

William Pulham.

*** Several letters on this subject were received too late for consideration this week.

## THE BLUNDELL-STREET SCHOOLS, CALEDONIAN-ROAD.

The new Board schools for Finsbury, in Blundell-street, Caledonian-road, have been opened. We gave a view and plans of these schools on the 15th of February last (pp. 126-127). It may here be mentioned that the building is designed for upwards of 800 children, but the exact number which it can accommodate amounts to 830—viz, 340 infants, 245 boys, and 245 girls. The building contains three stories, with a basement under part of the ground floor; it is commodious, and thoroughly well lighted and ventilated. The whole of the building is warmed by a heating apparatus supplied by Mr. D. O. Boyd, and every part is lighted in the evening with gas. Mr. Roger Smith was the architect, and the builders were Messrs. Roberts Brothers, of Islington. About 7,000*l.* was the cost of the building.

## ACCIDENTS.

*Fall of a Warehouse in Bristol.*—A serious accident has occurred at the Bull Wharf, Redcliff-street, Bristol, caused by the giving way of the flooring of an upper room, in which was an immense quantity of property, the weight of the falling mass carrying away the second floor in its fall. The premises in question were three stories high. The top room contained several hundred bags of oilcake, and the weight proved too much for the old timbers, which gave way, and the enormous weight broke through the flooring of the room underneath, which also contained large stores of oilcake and seed cotton, all of which fell into the basement among about 100 casks of tar. The lofts were supported by stout beams, but there had been indications that they were yielding to the pressure bearing upon them, and this, together with the fact that the building is very old, led Messrs. Danks & Sanders to have the beams running over the principal part of their premises strengthened with iron girders, and in one place, where the loft passes over their counting-house, they had an iron pillar erected.

*Fatal Fall from a Scaffolding at Macclesfield.*—Mr. Dunstan held an inquest at the town-hall on the body of Edward Turner, brick-setter. Mrs. Turner said that her husband had complained of a pain in the heart, but he went to his work as usual. Charles Tyrrell said that he was at work with deceased on a chimney at the end of a shed at Mr. Wilbraham's brickyard. They stood on a scaffolding 9 ft. high. About noon deceased stumbled; in falling he caught witness, and they both fell to the ground. Deceased did not appear to be much hurt, but witness was severely hurt on the shoulder. Deceased continued at his work, but complained of being badly shaken. Next morning he was found dead in bed. The jury returned a verdict to the effect that deceased had died suddenly from natural causes, death being accelerated by the fall on the previous day.

*Light in Gas Escapes.*—As search was being made *with a light* (!) for the whereabouts of an escape of gas in a back room of the Great Northern Dispensary, Marylebone-road, an explosion occurred, causing a painter named Mason to be blown off a wall on to the metals of the Metropolitan Railway,—a distance of some 30 ft. Mr. Bathe, the resident dispenser and assistant, had his head cut open and was severely shaken. They were taken to St. Mary's Hospital, at Paddington. Two women in the room escaped almost unhurt.

## SANITARY MATTERS IN ISLINGTON.

A valuable report on the sanitary condition of the parish of St. Mary, Islington, during the year 1872, by Charles Meymott Tidy, M.B., the medical officer of health and food analyst for the parish, to the vestry, has been printed. The reporter is justly severe on the private slaughter-house system, as a curse to the poor and a premium to dishonourable butchers, since they afford such opportunity for the slaughtering of diseased animals. Public abattoirs, as he remarks, would remedy this. In food investigations, as analyst, Dr. Tidy, found only four cases in which bread contained alum in twenty samples. Milk, he found, was improving; and tea in two cases both pure. The number of houses building in Islington in 1871 was 492; inhabited, 27,079; uninhabited, 2,414. In 1861 the number building was 551; inhabited, 20,074; uninhabited, 831. The population in 1871 was 97,745 males and 116,033 females. Of the houses building in 1871 there were 150 in West Islington and 342 in East Islington.

## CHURCH-BUILDING NEWS.

*Guildford.*—The work in connexion with the enlargement of Christ Church, Stoke, is approaching completion. On the north side a tower, aisle, and chancel, are being built, the contractors being Messrs. Swayne & Sons; the architect, Mr. Ewan Christian; and the cost 2,300*l.* The enlargement takes the form of a lean-to, and till the funds are raised to make the corresponding enlargement on the south side, the building will be greatly out of proportion. It is supposed, however, that in the course of the ensuing summer the requisite money will be forthcoming. The old side wall will not be removed till the outer walls and windows are finished. When finished there will be an additional accom-

modation for 250 persons. The tower and spire when finished will be 120 ft. high, but at present it is only proposed to carry it up to within 6 ft. of the ridge. The remainder of the tower will probably be erected when the enlargements of the south side are in course of completion. The inner sides of the walls show a pointed red brick, devoid of any plaster.

*Chesterton.*—The walls of St. Luke's Church are already many feet above the ground. Messrs. Thoday began work immediately the contract was signed. The chancel, three bays of the nave, the south transept and aisle, are to be built for 2,800*l.* At a meeting of the sub-committee it was decided to accept the tender of Messrs. Thoday to add three bays of the north aisle, at a cost of 340*l.* This will at once save the expense of a temporary wall, and add considerably to the accommodation. The north transept and vestry are still needed to complete this side of the church. It is hoped that friends will allow these additions to be made before the consecration, so that the church may be finished as far as it goes; two bays of the nave and aisle will still remain before the whole design is complete. Estimating the architect's fee and the clerk of the works at 10 per cent., the sum required above the first contract is about 900*l.* The estimate for the whole church is 5,500*l.*

*Halesowen.*—Some of the features of the old parish church were disclosed last year by the removal of plaster and whitewash from the walls, which had hidden for centuries some choice specimens of red sandstone of various shades. A groined roof under the tower showed in this process of cleaning, and has been brought into sight by the removal of the organ to a more convenient place. A further stage of the work of restoration is about to be commenced under the direction of Sir Gilbert Scott, and is described in a circular which has just been issued by the committee. It is intended to remove the north gallery and the partitions which now divide the church into two separate parts, and to restore the floor to its ancient level, furnished with open seats for 800 persons, whereas at present only twenty-four of the sittings are not subject to appropriation. The plans for the present year will include a new roof for the nave. The chancel will also be restored, and will be adorned with the window presented by friends as a memorial of the late Mrs. Hone. The outlay is expected to reach 1,500*l.*

*Halifax.*—During the last few weeks considerable improvement has been wrought upon the interior of Holy Trinity Church in the way of mural decoration. Mr. Binns, of Kingcross, has been the decorator. Instead of colouring the walls with whitewash, colours (mostly neutral tints) have been employed, and the result is that some specimens of ornamental plaster-work that have never shown before are now thrown prominently forward for the first time. The flat ceiling, 84 ft. by 54 ft., the largest in Halifax, has been traced out in panels, upon a warm grey ground, the dividing bands being relieved by scroll-work, and the large central ornament relieved in gold and blue. Fifteen large circles, with background of dark blue, are charged with various sacred emblems, worked in gold and colours. All the walls are coloured a bright drab, and a narrow band of dark chocolate running beneath the cornice and impost-mould serves to throw them out more prominently. The ceiling beneath the galleries is also broken into panels. The wall in the recess for the Communion has been decorated, the prevailing colours being dark chocolate and other lighter shades, relieved by diaper-work in gold.

*Holt.*—The parish church at Holt has been re-opened for divine service. The repairs and restorations have been carried out at a cost of upwards of 4,000*l.* Mr. John Douglas, of Chester, was the architect for the restoration. The works were commenced in 1871, the first portion undertaken being the roof and ceiling of the nave. The latter is carried out with moulded beams, each end being supported on carved corbels. The spaces between the beams are divided into panels by moulded ribs, having at the intersections spaces for patterns to be carved hereafter. The cornice is moulded, the carving having been omitted for the present. The ceiling of the chancel is elaborate. Some portions of the old ceiling were found used up in the nave roof; these were collected together, and used again. The whole of the carving in the ceiling has been completed. The aisles have also been re-roofed, and have plain ceilings executed in oak; the old corbels serving to carry the new brackets. The old panelled seats have been removed, the small portion of the floor remaining taken up, and re-laid with boards under the seats, and 4-in. Staffordshire tiles in the passages. The nave only is seated with oak benches, the elbows being of quaint designs. The aisles are for the present seated with chairs. The colour of whitewash has been removed from the walls, and the church has been heated by the Derwent Foundry Company. The stone groining of the tower, of which only the springers were in existence, has been completed. The whole of the windows have been re-paned and re-glazed with iron stanchions and tie-rods. The restoration of the chancel has cost about 1,000*l.*, the expense being defrayed by the Ecclesiastical Commissioners, and has been carried out under the direction of their architect, Mr. Ewan Christian, of London. The cost of the works carried out in the nave, aisles, and tower has been about 3,000*l.* The works were begun by the late Mr. J. Harrison, of Chester, but since his death they have been undertaken by Mr. J. Lewis, of Farndon. Mr. Lewis also did a portion of the work in the chancel (stalls, &c.)

*Bath.*—St. Andrew's Church, Bath, which has been built in the wealthy and populous district known as West Walcot, at a cost of 17,000*l.* (of which about 2,000*l.* remain to be raised) has been consecrated by the Bishop of Bath and Wells. The tower and spire are not included in the present contracts, but there is little doubt that they will be commenced as soon as the debt on the body of the building has been removed. The architect was Sir Gilbert Scott. The style is Early Decorated. The nave is upwards of 90 ft. long, and nearly 30 ft. broad, and will eventually terminate in a tower and spire, 220 ft. high. The chancel is 40 ft. by 25 ft., and the nave aisles, with porches, 70 ft. by 17 ft.; the latter are separated from the nave by four arches alternately clustered and octagonal, and, like the chancel aisles, are lighted by windows with three lancet lights, moulded, grouped, and shafted. The east window is one of three lights, with shafted mullions, and the exterior order is ornamented with foliage in its mouldings. The west window is of two lights, over which is a niche for the statue of St. Andrew. The stone used is Bath, Ham-hill, blue Corsham-down, and red Bishop's Lydeard, and the different colours give a relief to the work. The church is seated throughout with open seats, and is capable of accommodating upwards of a thousand persons. The builder was Mr. Bladwell, and the clerk of the works Mr. Irvine, who fills the same position at the Abbey Church and at Wells Cathedral. The total expenditure up to this time has been about 17,000*l.*

*Blundellsands (Liverpool).* — The memorial stone of a new church at Blundellsands has been laid in the presence of a large number of spectators. The new edifice will accommodate 600, and, when completed, will have cost about 6,000*l.*; but at present it is not intended to carry out the plans so far as the tower is concerned. The church, which is to be Early Decorated in style, will consist of chancel, 35 ft. by 25 ft.; nave, 79 ft. by 27 ft.; north and south aisles, 79 ft. by 15 ft.; south porch, 9 ft. by 8 ft.; tower at the north-west, 18 ft. square and 65 ft. high, and spire, 67 ft. high; organ-chamber at the north-east angle, 19 ft. by 13 ft. 6 in.; vestry at the south-east, 19 ft. by 13 ft. 6 in., with warming-chamber under. The nave will have an arcade of six arches on each side, supported by polished granite shafts, with moulded bases and carved caps; the responds at the east and west ends will be supported by carved brackets in the walls. Above the nave arcade is a clearstory, pierced with circular windows, traceried. The windows at the north and south of the aisles will be of two lights, filled with tracery. The west windows of the aisles will be of three lights, traceried. The west window of the nave will be of large size, containing six lights, with tracery. The chancel, which is apsidal at the east end, has seven traceried three-light windows. The floor is raised three steps above that of the nave. The organ-chamber will open into the chancel and aisle by means of stone arches. The roofs will be of pitch pine, partly open-timbered, with a ventilating chamber at the apex of nave and chancel-roofs. The heating will be effected by warm air on Haden & Son's principle. The roof of the chancel is a continuation of the plane of the nave roof, the principal timbers being carried by stone shafts rising from the ground. An ornamental cusped rib will take the place of the usual chancel-arch to separate the chancel from the nave. The walls will be of brick, with a cavity to secure the building from damp in a situation so exposed. The external facing is of Yorkshire Parpoints coursed; the dressings are of a yellow Storeton and Grinshill stone externally, the internal stone-work being of Bath stone. The gangways between the seats will be floored with pattern-tiles, those in the chancel being of a richer character. The whole of the benches and fittings will be of pitch pine varnished. The windows will be glazed with toned cathedral glass, and it is hoped that funds may be forthcoming to provide suitable stained glass for the chancel-windows at least. The contract has been taken by Mr. Hugh Yates, of Liverpool, for the sum of 3,850*l.* exclusive of the tower, and the works are being carried out from the designs and under the superintendence of Messrs. Thomas D. Barry & Sons, architects, Liverpool.

*Great Berkhamstead.*—The foundation-stone of a new church, to be called St. John the Evangelist, has been laid in this hamlet, which is situated midway between Berkhamstead and Chesham. Miss Dorrien, of Clifton, generously builds and endows the church. The edifice, it is estimated, will cost 2,200*l.*, and its site is on the green. The land is given by the lord of the manor, Lord Chesham. The church is intended for the accommodation of 235 persons, and its style is to be in Early English, the architect being Mr. G. Street, London, and the builder, Mr. Cooper, of Aylesbury.

*Sheffield.*—The chief stone of a new church has been laid at Abbeydale, a suburb of Sheffield. The church, which will be of the Early English style of architecture, will accommodate about 200 persons. Mr. Flockton, of Sheffield, is the architect; and Mr. Camm, of Norton, the contractor.

## DISSENTING CHURCH-BUILDING NEWS.

*Millbrook, Cornwall.*—Memorial stones of the Wesleyan Chapel here were laid on Sept. 3rd. Internally, the chapel will be 50 ft. long by 35 ft. wide, with the addition of a semicircular apse at the communion end of the chapel, intended for the choir and harmonium. There will be two vestries, and separate vestibules and entrances to ground-floor, and stairs to the gallery facing the reading-desk. The accommodation provided is for 400, the seating being 2 feet 8 inches from centre to centre, with aisles, &c. of considerable width. The contract (exclusive of the provision of stone) has been taken by Mr. S. Clarke, of Plymouth, at the sum of 883*l.* Messrs. Moorshead & Ching are the architects.

*Swansea.*—The foundation stone of a new place of worship intended for the use of the Calvinistic Methodist congregations of Bethany and Vincent-street, has been laid by Mrs. H. Hussey Vivian, of Parkwern. The new chapel is to be situated at the angle formed by Argyll-street and St. Helen's-road, almost opposite the lower end of Brunswick-street. It appears from the plan that it is to be in the Italian style. The entrance front, which will face St. Helen's-road, is approached by a broad flight of steps, and consists of a lofty portico formed by columns and pilasters of the Corinthian order, supporting a pediment of the full width of the building, the whole front being of Bath stone. There will be easy access provided to the chapel by three doors, and to the galleries by two. The chapel will have galleries on three sides, and will provide accommodation for about 900 sitters. At the further end behind the minister's platform a spacious organ gallery will be erected with an arched ceiling. Below the chapel there will be a large school-room (which can also be utilised for meetings), three class-rooms, and vestry, &c.; access will be obtained to these from side entrances. The building is to measure 76 ft. by 50 ft., and will cost from 4,000*l.* to 5,000*l.* complete. The architect is Mr. Alfred Bucknall, of Sketty.

*Leicester.*—The foundation stone of a new Wesleyan Chapel has been laid. This chapel, which is meant to seat from 300 to 350 persons, is intended to serve the purpose of a chapel and Sunday school, to a large new Wesleyan chapel, proposed to be built at some future period, at the corner of Saxe Coburg-street and Sparkenhoe-street. It is to consist of a large room, 60 ft. long by 27 ft. wide, with two class-rooms, each 15 ft. by 13 ft., at one end, and at the other end of the room is to be provided a gallery for a small organ and choir, if thought necessary. The roof is to be an open-timbered one. The

front next Saxe Coburg-street, is to be built of Cannock Chase bricks, with Bath and red Mansfield stone dressings, and the style adopted throughout is that prevalent in the early part of the fourteenth century. The building is being erected by Messrs. Neale & Son, from designs by Mr. Thomas Barnard, architect, Leicester.

## Books Received.

*Workshop Receipts for the Use of Manufacturers, Mechanics, and Scientific Amateurs.* By Ernest Spon. London: Spon, Charing-cross. 1873.

Many processes in the arts, trades, and manufactures are here recorded for behoof of a variety of persons, either engaged in trades, manufactures, and arts, or amateurs and desiring to carry out some practical experiment, as in dyeing, glass-working, varnishing or painting, engraving and etching, firework-making, bronzing, &c. No doubt among the great number of receipts and processes given some will be obsolete; and there will be new processes not given. Thus, for example, we can find no trace of the new sand process of etching on glass, &c.; and amid much matter about dyeing there is very little said as to the splendid new aniline colours; but the volume contains a vast store of useful matter, and it can never contain all that is newly discovered, or long known either.

### VARIORUM.

"The Royal Guide to the London Charities, for 1873–4. By Herbert Fry." (R. Hardwicke.) This is the eleventh annual edition of a list of the titles and addresses of the London charities, consisting of upwards of 200 pages, with from ten or twelve to twenty on each page. It speaks volumes for the charitable feeling of the givers, but not so much, perhaps, for the self-dependence of the receivers. A Guide to Charities not of value might, perhaps, be invidious, but would be useful.——"Transactions of the Manchester Statistical Society, Session 1872–73. Roberts, printer, Salford." There are here papers on Co-operation, by Dr. John Watts; on Luxury, by Professor A. S. Wilkins; on our Medical Charities and their Abuses, by Mr. William O'Hanlon; and on Commercial Bank Diffusion in Provincial England, by Mr. Henry Baker. The notable statement is made in Mr. O'Hanlan's paper, that in 1872 one in every four persons and a half in Manchester and Salford was in receipt of charitable medical relief in 1872! The number, it is added, has been almost doubled within the last thirty-six years; that is, the relative number was only one in every eight and a half of the population thirty-six years ago. The author of the paper gives suggestions for the reform of this state of the Manchester medical charities. He proposes the formation of a Charity Organisation Society, somewhat similar to the London one, by means of which many of the free dispensaries have been changed to provident ones.

## Miscellanea.

**The Sheffield Street Improvements.**—An adjourned meeting of the Sheffield town council has been held, for the purpose of discussing the remaining portions of the Improvement Committee's scheme of street improvements. The mayor moved the adoption of the minutes of the Improvement Committee, and then moved the making of "a new street from the end of Surrey-street into Fargate, opposite Orchard-street, and from Fargate across Orchard-place to the bottom of Bow-street, and the widening of Townhead-street, Tenter-street, and Westbar-green to Westbar." Mr. Sharman said they were proposing to spend something like two millions of money, and the surveyor's commission of 1 per cent. upon that sum would amount to 20,000*l.*; and if the law clerk took his commission of 1½ per cent.,—which would not be considered too much,—it would come to 30,000*l.*, making a total of 50,000*l.* The town trustees only proposed to give 40,000*l.* The mayor proposed the appointment of a committee to consider that question, and report to the council. The borough surveyor (Mr. Holmes) then explained the scheme in detail, and said he did not think the expense would be great in comparison to the improvement. After a discussion, the scheme was agreed to.

**Liverpool Royal Infirmary School of Medicine.** — The new buildings which have recently been added to the School of Medicine, in Dover-street, Liverpool, have been formally opened by Mr. John Torr, M.P. The principal additions and alterations are — a pathological and anatomical museum; a chemical laboratory with a private laboratory and class-room attached; and a physiological laboratory. The old building has, to a great extent, been remodelled; the dissecting-room has been considerably enlarged, and adjoining it a room has been fitted up with osteological preparations, skeletons, plates, and preparations illustrative of elementary anatomy. A demonstrators' room opens into the dissecting-room, and every convenience in the way of lavatory and dressing-rooms is provided. The old museum has been converted into a library and reading-room for the use of the students. These extensions and improvements, including the amount of existing contracts for work not completed, have involved an expenditure of 5,326*l.*, a sum which, in consequence of the advance in the cost of labour, and of almost everything used by builders, is largely in excess of the amount which the lecturers, at the commencement of their undertaking, were led to believe would be required. The committee have entered into a contract for fitting up the parts of the museum required immediately; but the fitting-up of the gallery has been postponed.

**Sanitary Report on Northamptonshire, &c.**—A sanitary report has been read before the central committee of the combined delegates, the sixteen sanitary authorities of Northamptonshire, Leicestershire, Rutlandshire, and Buckinghamshire, at a meeting held in the county hall, Northampton, on Saturday, 27th September, 1873, Mr. J. L. Stratton, of Turweston Hall, Brackley, in the chair. The report was signed Alfred Haviland, Medical Officer of Health of the combined sanitary authorities of Northamptonshire and other counties. The subject of the report was "The Sanitary Inspectors' work during the last six months." The number of parishes, places, &c. visited by the sanitary inspectors, amounted to 336, out of 352, so that only sixteen parishes in this extensive area remained unreported. In a great many instances these parishes had been visited on foot, and entailed a large amount of physical labour. Of nuisances detrimental to the public health, there were hunted out 3,745, or one nuisance to every 13·2 houses of the 49,609 inhabited houses within the combined area of the sanitary authorities. These nuisances consisted of 932 foul and offensive privies overrunning with filth, and polluting water-courses, wells, and the atmosphere with their sewage ooze and foul mephitic gases. Nearly all these have been remedied. Of cesspools 291 were complained of, but only 159 either removed or remedied.

**Prizes for Cabs.**—The committee of judges appointed by the Society of Arts came to the unanimous conclusion that, although there were some of the carriages which exhibited considerable merit, there were none of sufficient merit to warrant the judges recommending any for reward, and a notification to this effect was communicated to all the competitors. The judges were, however, of opinion, that there were six which were worthy of further consideration if certain objections could be satisfactorily obviated and suggestions for further improvement carried out; and, accordingly, to these six competitors a statement to the foregoing effect was made, with an intimation that if they were willing to send in further improved carriages, the judges would take them into consideration. With reference to the further improved cabs sent in by the six selected competitors, they have recommended that the total amount offered,—viz., 120*l.*,—should be divided equally between these four, as follows:—Two-wheelers—C. Thorn, Norwich, 30*l.*; Forder & Company, Wolverhampton, 30*l.* Four-wheelers—Lambert, 66, Great Queen-street, 30*l.*; Quick & Norminton, 8, Netherwood-street, Kilburn, 30*l.*

**The Proposed Fine Art Gallery for Liverpool.** — The subscriptions originated by Mr. Picton, architect, with 1,000*l.*, having reached more than one-fourth part of the requisite sum, a public meeting has been held, at which it has been resolved to be desirable to erect a permanent art-gallery, and, for that purpose, to obtain subscriptions to the extent of 20,000*l.* A committee has been appointed, and further subscriptions received: in all, 5,870*l.* have now been subscribed.

**Working Men's College, Great Ormond-street.**—The twentieth annual meeting of the members of the Working Men's College, in Great Ormond-street, has been held; Mr. Hughes, M.P., in the chair. The room was crowded. Among those present were the Rev. Canon Kingsley, Lord E. Fitzmaurice, M.P., and Rev. Llewellyn Davies. The chairman, in opening the proceedings, said that they started that night under a new constitution. For eighteen years they had been under the guidance of a great and good man. Since that time they had endeavoured to establish, and they had been successful in establishing, the reconstruction of the college. They were taking "a new departure" that night. The great change made was that they were able to take a great number of students into the council, and they hoped that that would very much strengthen their hands, and help them to carry on the work in the spirit in which it had been carried on from the beginning. The Rev. Canon Kingsley and other gentlemen then addressed the meeting.

**The Last of another Old City Church.**—St. Antholin's (or St. Anthony's), Watling-street, is about to be disposed of. The Ecclesiastical Commissioners propose to partially demolish the church, and totally abolish it as a place of worship. The benefice, says the *Daily News*, is to be united with that of St. Mary, Aldermanbury-cum-Saint Thomas Apostle, and henceforward, the five accustomed worshippers in the church at the corner of Sise-lane will have to cross the road and swell the throng of eight who, Sunday after Sunday, meet in the church of St. Mary, the beautiful tower whereof peeps out from amid the cluster of modern shops and offices with which a utilitarian Board of Works have ruthlessly surrounded it. With a portion of the money accruing from the sale of the valuable site, a church is to be built at Nunhead. The tower and spire are to be left standing, and a considerable sum is to be expended in repairing the former, and adapting it to the reception of the human remains, which lie thickly in the church vaults.

**The Erection of Back-to-Back Houses.**—An important question to owners of property in Leeds is now under consideration. The case has been brought before Mr. Bruce at the Leeds Town-hall. The town clerk (Mr. C. A. Curwood) applied to him for an order to demolish a building which had been erected, as he alleged, contrary to the terms of the Act of Parliament relating to the space to be kept open in connexion with back-to-back houses, for the purpose of ventilation. In opening his case, Mr. Curwood said this case was intended to be a test one, and it was deemed of so much importance by the corporation that if the law was not found to be sufficient to enforce the observance of the requirements, further legislation must be obtained. After being argued *pro* and *con.*, Mr. Bruce intimated that he should reserve his decision.

**Memorial of the late Bishop Wilberforce.** A numerously-attended meeting was held in the Sheldonian Theatre, Oxford, to receive the report of the Diocesan Committee as to the form the proposed memorial to the deceased prelate should take. The report stated that several schemes had been suggested in committee, including the erection of a new cathedral, the erection of a new chapel and additions to Cuddesdon College, and other minor suggestions. The meeting was presided over by the Bishop of the diocese. A long discussion took place whether there should not be a memorial in Oxford in the shape of a college for the training of students for missionary work, but eventually it was decided that the form of memorial should be in the erection of the proposed chapel, and a committee was appointed to carry out the work.

**Africa and Life Assurance.**—In some recent remarks upon the hardship inflicted upon officers ordered to the West Coast of Africa, at the risk of death, it was suggested that even those who possessed life assurance policies were compelled to forfeit them upon being detailed for this dangerous service. We are informed that this impression is erroneous with regard to the policies issued by one old-established office, "The Mutual," of King-street, Cheapside. Since 1868, "The Mutual" has guaranteed its policy-holders against all risks of foreign travel, and every other contingency, without extra premium, in every case where the policy is five years old, and the life is thirty.

**New National Schools, Amersham, Bucks.**—On the 30th ult. the above block of buildings was formally opened by Dr. Bickersteth, the Archdeacon of Bucks. The rooms comprise boys' and girls' schoolrooms, each 46 ft. by 18 ft., with class-rooms, each 14 ft. by 15 ft., infants' room, 32 ft. by 18 ft., hat and cloak lobbies, porches, &c. The site is 3 roods. The materials are of red brick and freestone; the roofs are tiled, and surmounted by a lofty bell-turret. The accommodation provided is for 284, and the total cost of the works will be about 1,650*l.*, including all fittings, fencing, and a small detached school for thirty infants at Woodrow, an outlying part of the same parish. The works have been executed by Mr. George Reavell, of Windsor, from the designs of Mr. Arthur Vernon, architect, High Wycombe.

**What British Ironmasters are Doing.**—Under this title a contemporary says:—A number of British ironmasters have just acquired nearly twenty square miles of property in the Whare-kawa district, in the province of Auckland, New Zealand. The property embraces 8,700 acres of coal and iron-stone. The chief seam of coal is found in some parts within a few yards of the surface, as thick as 20 ft., and it is computed to be capable of yielding an average thickness of 10 ft. throughout the whole 8,700 acres. This represents no less than 126,000,000 tons of good coal. The ironstone is of the brown hematite class, and contains as high a per-centage as 62 of fine iron, and is believed to yield an average of 50 per cent.

**Sanitary Progress.**—An anonymous donor has placed a large sum in the hands of the committee of the Birmingham and Midland Institute for the foundation of a Lectureship on the Laws of Health, and also for a prize fund in connexion with the class. According to *Nature*, Dr. Corfield has been offered the post for this year, has accepted it, and was to deliver an inaugural lecture in the Town-hall, Birmingham, on Thursday, October 9th, at 8 p.m., on "Sanitary Progress." The course will begin on Tuesday, October 14th, at 8 p.m., and be continued on succeeding Tuesdays until some time in April. It is intended more especially for the working classes, and both men and women will be admitted.

**Workmen employed in Private Houses.** At the Guildhall Police-court, London, a workman has been convicted of committing a robbery at the place where he was employed by a builder in the execution of some repairs. Sir R. Carden asked whether a character was given by the prisoner before he was engaged, and the reply being in the negative, because "it was not the custom to require workmen to produce characters," the Alderman spoke strongly upon such a state of things, and said that respectable builders ought to be more careful of the property of gentlemen who engaged them, than to allow men without characters to enter their premises.

**A Public Library for Worcester.**—A conference has been held in the Guildhall, Worcester, under the presidency of Mr. A. C. Sherriff, M.P., for the purpose of considering the steps to be taken in Worcester for the adoption of the Public Libraries Act, when it was resolved that an effort be made to secure the adoption of the Act for the city of Worcester, and that a subscription be set on foot towards defraying the cost of buildings, fittings, and books. A committee was appointed and empowered to carry these resolutions into effect.

**A New Pick.**—Mr. J. Reidy, of Kennington, has produced an improved pick-axe for excavating and other purposes. By the introduction of a socket-head on the end of the shaft of the pick, a taper hole passes through the head and handle, through which a cast-steel blade or tool can be put and taken out at pleasure, at a saving of time and expense, as a number of cast-steel blades can be taken with the pick. The blade will resist the hardest substance, and the head or body will always remain fit for use.

**The Jersey Banking Company's New Premises.**—The street architecture of St. Helier's will be improved by the new bank premises in progress. The materials are grey and pink granite, with Portland stone dressings. All the capitals are carved. A cornice extends the whole length of two sides of the building. The carving has been done by Mr. Harry Hems, of Exeter, and assistants. The builders are Messrs. Tostevin & Fallaize.

**Sewage Farming in Germany.**—An enterprising Scotsman, named Aird, has lately undertaken to introduce the sewage farm system into North Germany, and has leased for thirty years, at 1,200*l.* a-year, 2,000 acres of sandy waste which lies between the Baltic and the port of Dantsic. On this hitherto barren spot he is now carrying on operations vigorously: 200 acres have been levelled off, supplied with sewage in the liquid form, and put into root and garden crops, which are visited daily by curious crowds.

**Builders' Hand-power Machinery.**—At the recent meeting of the Manchester and Liverpool Agricultural Society at Chester, a silver medal was awarded to Messrs. F. W. Reynolds & Co., of Southwark-street, for hand-power machinery. Messrs. F. W. Reynolds & Co. have issued a catalogue containing numerous illustrations of their various labour-saving hand-power machines, and they show their confidence in these numerous inventions by offering to send the machines for a month's trial before purchase.

**Dunfermline.—New Works.**—Building operations are being carried on in Dunfermline at present on an extensive scale. Among other buildings in course of erection there are a damask manufactory (which is to be fitted out with 300 power-looms) for Messrs. R. E. Walker & Co., at Gardener's Land; a foundry at Whitemire, a brewery at Grantsbank, and an office for the National Security Savings Bank in Viewfield-place. The erection of a large factory near Grieve-street is also contemplated.

**Gift to Warrington.**—The local *Guardian* states that an addition is about to be made to the recent gifts to this town of 9,000*l.* by Mr. George Crosfield, and 3,000*l.* by Colonel Wilson-Patten. Mr. Hatton, of Hatton, to whom Warrington is already indebted for the gift that laid the foundation of a hospital for the town, has expressed his intention of giving another 5,000*l.* for the support of the hospital.

**Coal-cutting Machines.**—By the patent of Messrs. J. H. Stubbs and G. H. Cottam, of Hunslet, near Leeds, the cutting-tool has a simultaneously reciprocating and rotary motion imparted to it, and cuts preferably spirally; the framework mounted on a tram, and the tool moved forward by self-acting or other means. Motion is imparted by any suitable motive-power.

**Durham Cathedral.**—In addition to the several stained-glass windows which have already been inserted in the nine altars and south transept of this cathedral, it is understood the Freemasons of the city are about to place a window in the nine altars, in memory of Mr. John Pawcett. Major Joicey and the dean are also about to add stained windows to the south aisle, whilst other probable gifts are mentioned.

**"Self-Help" in Japanese.**—A Japanese translation of Mr. S. Smiles's "Self-Help" has been made. The English work forms an octavo of moderate size. In Japanese it has expanded into a book of 1,500 or 2,000 pages. It is not bound after the modern European fashion, but divided into eleven parts, each of which is neatly, but loosely, stitched with one silk thread.

**The Slums of Drury-lane.**—We hear, with more regret than surprise, that typhus fever is prevalent in Lincoln-court, Little Wild-street, and Great Wild-street. Readers may recollect our description of these and surrounding places some years ago, and the warning given.

**Reports on Vienna Exhibition.**—The volume of Artizans' Reports upon the Vienna Exhibition, published by the Society for the Promotion of Scientific Industry, Manchester, will be issued about the 20th of this month. There are thirty-six reports.

**Bridgwater.**—Mr. Hippisley, surveyor, of Wells, has been appointed by the town council for the purpose of surveying and preparing an estimate of the relative cost of establishing the proposed new cattle-market at Blacklands, and in the corporation field in North-street.

**Proposed New Gaol, Bristol.**—The Bristol town council, at their meeting last week, purchased, on the recommendation of the gaol and bridewell committee, the site of a new prison to be erected on the Horfield-gardens for the sum of 3,875*l.*

## TENDERS

For the erection of infant nursery and mission-room, Wellclose-square, Whitechapel. Messrs. Greatorex & Co., architects. Quantities supplied:—

| | |
|---|---|
| Ennor | £1,919 0 0 |
| Outhwaite & Son | 1,768 0 0 |
| Clark & Boyce | 1,752 0 0 |
| Botting | 1,751 0 0 |

For villa residence in Church-fields, Salisbury, for Mr. T. Goodwin. Mr. Fred. Bath, architect. Quantities by the architect:—

| | |
|---|---|
| Plowman | £703 0 0 |
| Tryhorn & Harris | 690 0 0 |
| Aldridge | 685 10 0 |
| Bridle & Co. (accepted) | 612 10 0 |
| Young | 600 0 0 |

For additions to residence, the Ridgeway Oaks, Enfield, for Mr. F. S. Foley. Mr. T. J. Hill, architect:—

| | |
|---|---|
| Bentley | £325 0 0 |
| Patman | 311 0 0 |

For new schools, Monte Video-place, Marylebone. Mr. E. R. Robson, architect. Quantities by Mr. W. F. Meakin:—

| | |
|---|---|
| Perry & Co. | £6,300 0 0 |
| Kirk | 6,218 0 0 |
| High | 6,200 0 0 |
| Merritt & Ashby | 6,160 0 0 |
| Sheffield | 6,127 0 0 |
| Scrivener & White | 6,078 0 0 |
| Staines & Son | 5,986 0 0 |
| Mann | 5,943 0 0 |

For new shops and premises, King-street, Maidstone, for Mr. J. Marchant. Mr. G. Friend, architect. Quantities by Messrs. Curtis & Son:—

| | |
|---|---|
| Anscomb | £1,597 0 0 |
| Grensted | 1,595 0 0 |
| Vaughan | 1,563 0 0 |
| Avard | 1,515 0 0 |
| Elmore | 1,480 0 0 |
| Clement & Wallis | 1,464 0 0 |
| Bridge & Cox | 1,460 0 0 |
| Abnett (accepted) | 1,445 0 0 |

For schools in Borough-road, Southwark, for the London School Board. Mr. E. R. Robson, architect:—

| | |
|---|---|
| Staines & Son | £8,576 0 0 |
| Higgs | 7,987 0 0 |
| Stevenson | 7,952 0 0 |
| Newman & Mann | 7,850 0 0 |
| Tarrant | 7,727 0 0 |
| Nightingale | 7,687 0 0 |
| Downs & Co. | 7,380 0 0 |
| Kirk | 6,977 0 0 |

For schools, Brunswick-road, Poplar, for the London School Board. Mr. E. R. Robson, architect:—

| | |
|---|---|
| Hearle | £3,350 0 0 |
| Sarjant | 3,186 0 0 |
| Thompson | 3,140 0 0 |
| Downs & Co. | 3,035 0 0 |
| Newman & Mann | 2,998 0 0 |
| Sheffield | 2,987 0 0 |
| Nightingale | 2,976 0 0 |
| Sewell & Son | 2,953 0 0 |
| Ennor | 2,885 0 0 |
| Kilby | 2,840 0 0 |

For asylum at Banstead. Mr. F. W. Pownall, architect. Quantities by Mr. Charles Poland:—

| | |
|---|---|
| Niblett & Son | £181,000 0 0 |
| Wright Brothers & Goodchild | 180,000 0 0 |
| Crockett & Dickenson | 173,000 0 0 |
| Bull & Son | 172,000 0 0 |
| Downs & Co. | 161,190 0 0 |
| Chappell | 158,130 0 0 |
| Booth | 154,500 0 0 |

For addition to Messrs. Flower & Son's Brewery, Stratford-on-Avon. Mr. Joseph Lattimer, architect:—

| | If blue brick floor. | If Val de Travers paving. |
|---|---|---|
| King & Godwin | £4,197 | £4,465 |
| Green & Son | 4,120 | 4,455 |
| Parker & Son | 3,997 | — |
| Foster | 3,823 | 3,988 |
| Holmes | 3,737 | 3,988 |
| Greenway & Price | 3,413 | — |
| Callaway | 3,400 | 3,655 |
| Claridge | 3,293 | 3,540 |
| Davis (accepted) | 3,250 | 3,500 |
| Chinnock | 3,100 | — |

For rebuilding workshops at the rear of No. 155, Upper-street, Islington, for Mr. John Nobbs. Mr. H. Wilson, architect. Quantities not supplied:—

| | |
|---|---|
| Bamford | £600 0 0 |
| Chinney | 545 0 0 |
| Lewis | 516 0 0 |
| Evans (accepted) | 420 0 0 |

For painting, &c., Congregational Church, Stratford, E.:—

| | |
|---|---|
| Waller | £290 0 0 |
| Gore | 240 0 0 |
| Charlton & Martin | 197 0 0 |
| Wayman | 184 0 0 |
| Sarjeant | 143 0 0 |

Accepted for the erection of boys', girls', and infants' schools, with out-offices, caretaker's cottage, fence, walling, &c., at Berry-brow, for the Huddersfield School Board. Mr. Edward Low, architect. Quantities supplied by Mr. F. Johnstone:—

*Excavators', Bricklayers', and Masons' Work.*

| | |
|---|---|
| Graham & Sons | £2,749 0 0 |

*Carpenters' and Joiners' Work.*

| | |
|---|---|
| Kirby & Scholes | £797 0 0 |

*Tiling and Slating Work.*

| | |
|---|---|
| Goodwin & Sons | £377 0 0 |

*Plumbing, &c., Work.*

| | |
|---|---|
| Garton | £173 10 8 |

*Plastering Work.*

| | |
|---|---|
| Jessop | £140 19 4 |

*Ironmongers' Work.*

| | |
|---|---|
| James Brooke | £115 0 0 |

*Painters' Work.*

| | |
|---|---|
| Moxon | £90 0 0 |